North Fork American River Trail

Trail Plan

Placer County Facility Services
California

September 2003

Table of Contents

NORTH FORK AMERICAN RIVER TRAIL
TRAIL PLAN

INTRODUCTION

The Auburn State Recreation Area has an established network of trails throughout the American River Canyon that provide a variety of recreational opportunities. With the substantial growth that Placer County has experienced over the last two decades and the associated demand for recreational facilities—specifically hiking, biking, and equestrian activity along the North Fork American River—expansion of the trail network in this area has emerged as a priority to accommodate County residents and visitors alike.

Consequently, Placer County Department of Facility Services (Facility Services), in conjunction with the California Department of Parks and Recreation (DPR), has prepared the *North Fork American River Trail Plan* (herein referred to as the "Trail Plan") to augment the existing trail network in response to this demand. The North Fork American River Trail project is proposed as a multiple use trail that will begin at the confluence of the North and Middle Forks of the American River and end at Ponderosa Bridge, approximately 12.6 miles upstream.

The purpose of the Trail Plan is to provide Facility Services with a working document that describes the project background setting, and scope; and provides guidelines for plan implementation including detailed trail construction techniques, and preliminary cost estimates. The Trail Plan will also be used to assist the County in 1) coordinating the environmental review process; 2) informing the community about the project; 3) applying for grants to fund trail development; and 4) soliciting bids for trail construction.

BACKGROUND

The genesis for the County's project grew out of a concept initiated by Placer County Supervisor Rex Bloomfield to develop a continuous trail from Sacramento to Carson City, Nevada, along the North Fork American River canyon; this conceptual plan is referred to as the Capital-to-Capital Trail or "Cap-to-Cap" Trail. The Cap-to-Cap trail concept has been around in various forms for decades.

Several years ago, Placer County staff and elected officials began meeting with the primary land management agencies that had jurisdiction along the proposed Cap-to-Cap trail route; they also met with interested trail groups to gauge interest and to gain support for the conceptual project. As momentum increased and some funding sources were tentatively identified, Placer County entered into negotiations with United States Bureau of Reclamation (USBR) and DPR, since portions of the conceptual route would cross both Folsom and Auburn State Recreation Areas (Note: USBR is the landowner of both Folsom Lake SRA and Auburn SRA, and DPR has an operating agreement to manage both of these facilities).

As a result of these negotiations, DPR identified a number of concerns with the proposed trail concept. These included 1) potential user conflicts due to the varying allowed uses on the proposed Cap-to-Cap trail; 2) poor condition of existing trails along the route; 3) the proposed trail alignment and its proximity to the river; 4) future maintenance of the trail; and 5) determining if there was a common vision for the trail among the involved agencies.

The County originally identified construction of a new section of trail from the Confluence to Ponderosa Bridge in Auburn SRA as "Phase 1" of the Cap-to-Cap Trail concept. In subsequent meetings with DPR, the County addressed many of the agency's concerns: 1) acknowledging DPR and USBR would need to approve the trail alignment; 2) agreeing to provide some separation between the trail and river; 3) providing for future maintenance of the trail; and 4) assisting with the assessment of trail repairs needed on existing trails in the proposed Cap-to-Cap route.

The County also agreed to design the trail section from the Confluence to Ponderosa to function as a stand-alone section with adequate parking and staging facilities, as well as connections to existing trails. Under these conditions, DPR agreed to explore the development of the North Fork American River Trail from the Confluence to Ponderosa Bridge.

At this time, the Cap-to-Cap Trail remains a concept and there are many potential barriers to completing such a trail in the upper portions of the North Fork Canyon. These potential barriers include private land ownership, extreme topography and Wild and Scenic River and Wilderness designations. DPR believes that developing a trail from the Confluence to Ponderosa is appropriate given the topography and other physical characteristics, existing uses and development in this portion of the Canyon, and the direction in existing management plans for the area.

DPR will not consider developing any further sections of trail in the North Fork Canyon above Ponderosa Bridge until the General Plan for Auburn SRA has been completed. It is anticipated that the General Plan process will begin in 2004. The General Plan will determine if the development of trails or other facilities in these portions of the Canyon is appropriate.

TRAIL ADVISORY GROUP

With DPR concurrence on exploring a stand-alone North Fork Trail from the Confluence to the Ponderosa Crossing, Placer County Facility Services began work on identifying an alignment and convened a citizens' Trail Advisory Group (TAG) to work through issues related to the trail alignment and design. It was anticipated that, by providing an opportunity for citizen input from the outset, salient issues and areas of controversy would be identified and dealt with early in the process.

The TAG is comprised of 12 representatives from various trail groups (i.e., equestrians, hikers, mountain bikers), environmental organizations and DPR (see *Appendix A* for the list of members and their affiliations). This group met monthly for five months and in the field on two occasions, guided by their mission statement to focus discussions and stay on task. The mission statement reads as follows:

"To provide information and assistance for the creation of a multiple use trail from the Confluence to Ponderosa Bridge that conserves the wilderness and scenic values of the land."

From the TAG's meetings, discussions and recommendations, the following components were created as part of the Trail Plan:

Intent for a Stand-Alone Trail

The TAG developed recommendations, in conjunction with the involved agencies that were exclusive to the North Fork American River Trail. The group's effort emphasizes that no other trails within the Canyon of the North Fork of the American River or other sections of the Cap-to-Cap trail concept were considered.

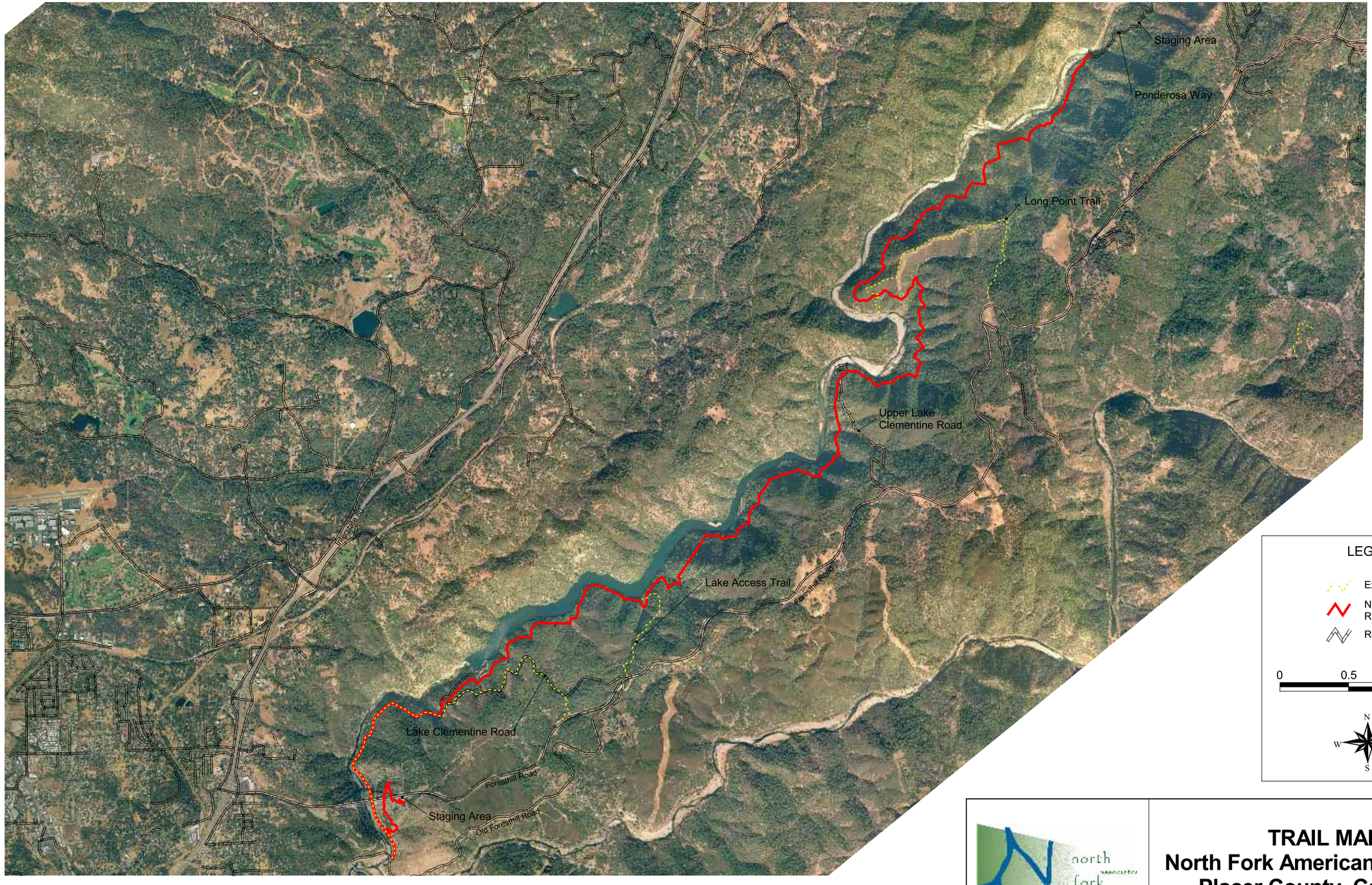
Recommendations regarding trail design, allowable uses, alignment, etc. were based on the premise that the section of Canyon from the Confluence to Ponderosa is less remote and more heavily used than upstream portions of the North Fork Canyon. The existing level of use and development in this lower portion of the Canyon is much different than the upper portions of the Canyon. The location, alignment and design for a trail from the Confluence to Ponderosa section are intended for this stand-alone section and may not be appropriate for other sections of the Canyon. Existing uses within the proposed project area include:

- Use of the trail from the Confluence to Lake Clementine;
- Motorized and non-motorized boating on Lake Clementine;
- Boat-in camping at Clementine; day use and swimming at Upper Clementine; white-water rafting from Ponderosa;
- Day use at Ponderosa Crossing; and
- Hiking on other existing trails in the area.

Trail Alignment

The TAG was assigned to give the County guidance on deciding which side of the river to route the trail. To aid in the selection of the proper trail alignment, the group established a set of evaluation criteria. Using the criteria listed below, the TAG reached consensus on routing the trail on the south side of the Canyon and approved the proposed trail route that was then flagged and mapped with a GPS unit.

- *Reduce visibility of trail from river/lake*
- *Minimize environmental impacts of trail construction, including the avoidance of sensitive areas*
- *Promote safe grades and safe alignment*
- *Connect to staging areas*
- *Connect to existing trails*
- *Ensure emergency access to trail*
- *Reduce construction costs (use of existing trails and roads)*
- *Minimize conflicts with private property*
- *Minimize conflicts with trail users*



LEGEND

- Existing Trails
- North Fork American River Trail
- Roads

0 0.5 1 Miles

N
W E
S

north fork

TRAIL MAP
North Fork American River Trail
Placer County, California

Trail Design and Construction

Discussions then turned to trail design criteria, vegetation clearing on the trail corridor, and methods of construction. The TAG was very concerned about the physical and visual affects of trail construction in the canyon environment.

Two field trips acquainted the group with issues relating to steep side slopes in the canyon, and examples of recent trail construction at Auburn SRA, the Foresthill Divide Loop Trail and the Connector Trail. The newly completed Connector Trail was an example of a new meandering style of multiple use trail design. This design incorporates ample sight distance for trail safety combined with dips and turns to slow traffic down. Both trails were constructed with a combination of a trail cat and hand construction.

The two major issues confronting the group pertained to trail width and method of construction. After lengthy discussions and negotiations, the TAG reached consensus on these and other trail design issues, which are discussed in subsequent sections of this report. (See *Trail Design Guidelines on Page 30*)

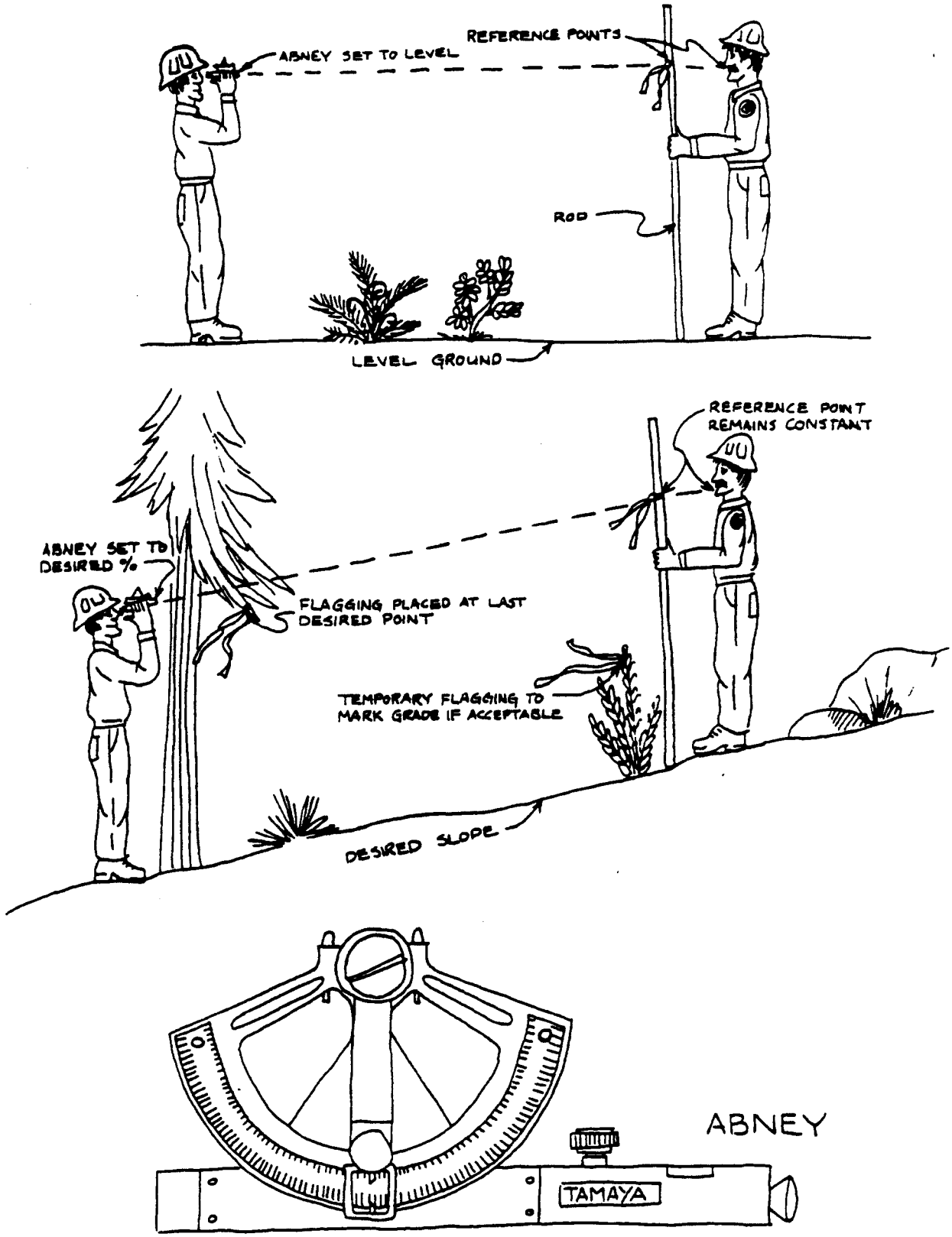
TRAIL PLAN

1. Establishing the Proposed Trail Route

With direction from the TAG, the task of establishing the proposed trail route on the south side of the canyon was initiated. The trail coordinator assisted by Placer County Supervising Parks and Grounds Worker scouted and flagged the proposed alignment. The first step in this process was to walk and scout the entire length of the project area looking for the most suitable route, trying to avoid large outcrops and other control points. To ensure the establishment of a comfortable and safe grade, an abney level was used (*see Figure 1)*. A leap-frog system was utilized, establishing the grade, flagging that spot, and shooting the next grade from that newly flagged portion. The goal was to keep grades under 10% and avoid trees, preferably on the high side, to avoid damage to root structure during construction. The flagging of the approximately 12.6-mile route took several months to complete and a total 204 hours were expended on this task.

2. *Mapping the Trail Route*

After the proposed trail route was flagged, the trail coordinator and a Placer County surveyor walked the alignment with a GPS unit. In addition to recording the trail route, other features such as stream crossings, bridge sites, and rock retaining walls were also entered. A total of 54 hours were expended on this portion of the project. This data was plotted and mapped at the Surveying and Mapping office at Placer County Department of Public Works. Because of the nature of the steep canyon walls, there were areas where satellite reception was marginal and the GPS information was less than accurate. Manual adjustments were made during the plotting stage to help rectify this problem. All trail and feature lengths (stream crossings, rock walls) were extrapolated from this data to form the project cost estimate.



north fork associates

Source: *Trails Handbook*, California Department of Parks and Recreation

Figure 1

SIGHTING FOR GRADE WITH ABNEY

North Fork American River Trail

Placer County, California

3. Brushing, Clearing, and Tight Flagging

The standards suggested by the Trail Advisory Group were intended to minimize the physical and visual effects of vegetation removal while promoting safe line of sight distances. The TAG suggests initial clearing for the trail corridor to be between 8′ and 15′ wide with a height of 10′to accommodate equestrian use. As previously discussed, the proposed trail route was flagged with the intention of bypassing trees. The clearing standards emphasize the need to minimize removal of native trees greater than 6″ dbh. All brush and trees shall be cut flush with the ground and limbs cut flush with the tree trunk. (*See Figures 2 and 3*)

All cut vegetation will be chipped and broadcast (where feasible) or hauled out of view of the trail, preferably above the trail. After the trail corridor has been cleared, the trail route will be tight flagged, incorporating the new meandering trail design. This is accomplished using pin flags, placed at the top of the cut slope, no more than 8′ between flags. The dips and undulations in the design should mirror the natural drainage patterns to facilitate effective surface flow of water off the trail tread.

4. Trail Construction

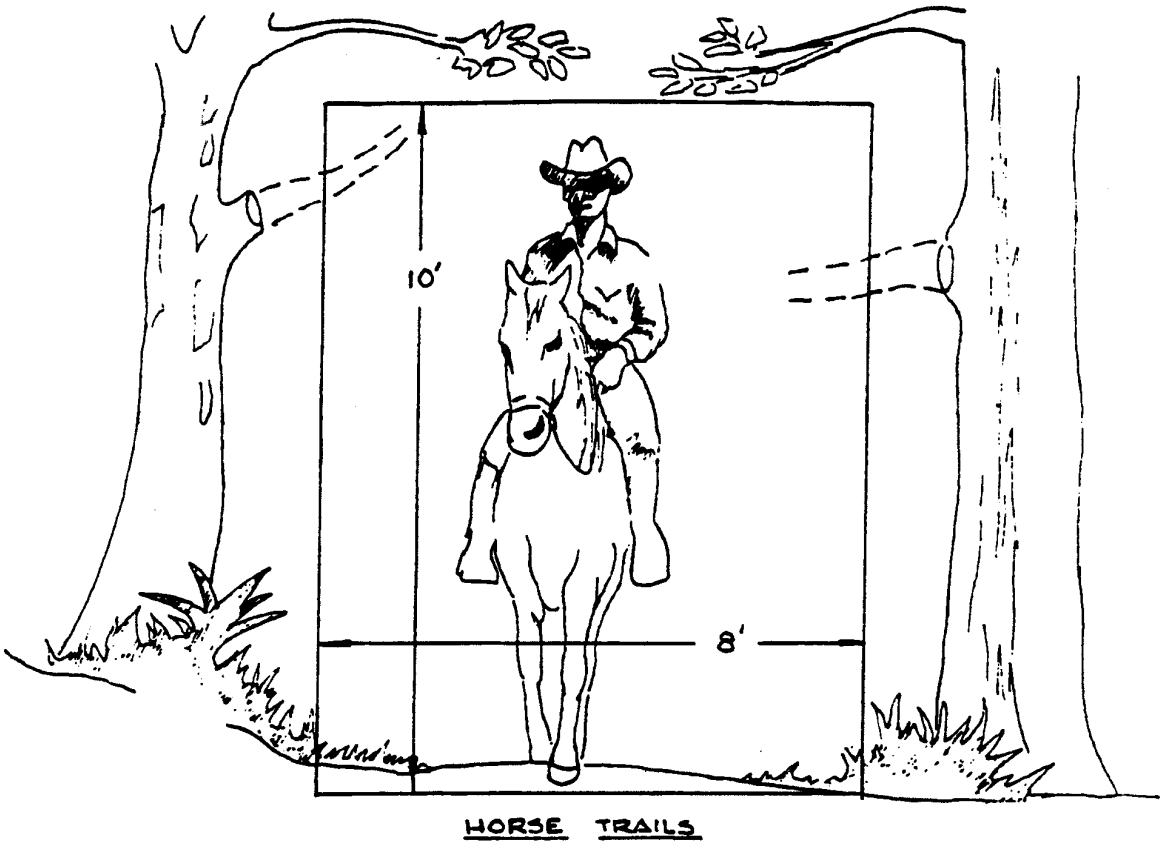
After the trail has been tight flagged, vegetation and duff should be removed from the trail route and raked above the flag line. This material will be used after trail construction to aid in revegetation and erosion prevention. Due to the steep side slopes and the need to support equestrian traffic, full bench construction will be used on the trail bed. This means that the whole trail will be cut out of the hillside, and no fill will be used. The trail width will be 4′ with an outslope of 2-4% depending on the grade of the trail. Outsloping is the grading of the trail so the outside edge is lower than the inside. A general rule is the steeper the grade, the more outslope is required. This facilitates sheet drainage of water off the trail, instead of water flowing down the trail, eventually causing erosion. *(See Figure 4)*

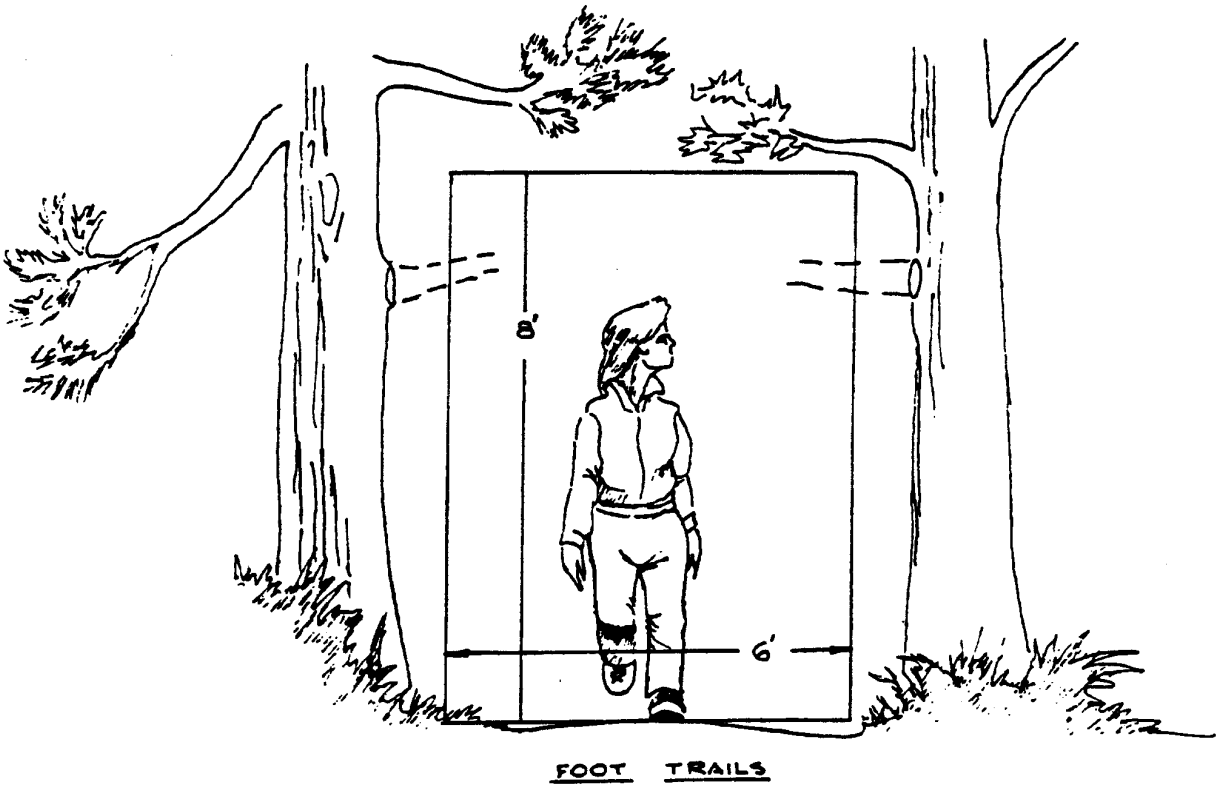
On steep cross slopes (generally greater than 45 degrees) and/or where required to provide room for trail users to safely pass one another, 5-foot wide turnouts will be provided. Turnouts will be sized to accommodate a horse and allow other trail users to pass. Location and intervals of turnouts will be constructed at the discretion of the trail coordinator.

5. Stream Crossings and Drainage Features

Along the 12.6-mile trail route, there are 35 ephemeral streams that need to be crossed. Four of those crossings will require construction of bridges. Two key factors in bridge construction are the seasonal levels of water in the particular drainage, and the configuration of the banks of the stream. Generally, bridges and other structures should be avoided because of their high cost of construction and maintenance. Where possible, natural stream crossings or fords are desirable.

To support the additional weight of horses, bridges will be designed with three (3) stringers. Decking surfaces must have a minimum thickness of 4 inches and a minimum tread width of 60 inches with 52 inches between handrails or bull rails. When handrails





north fork associates

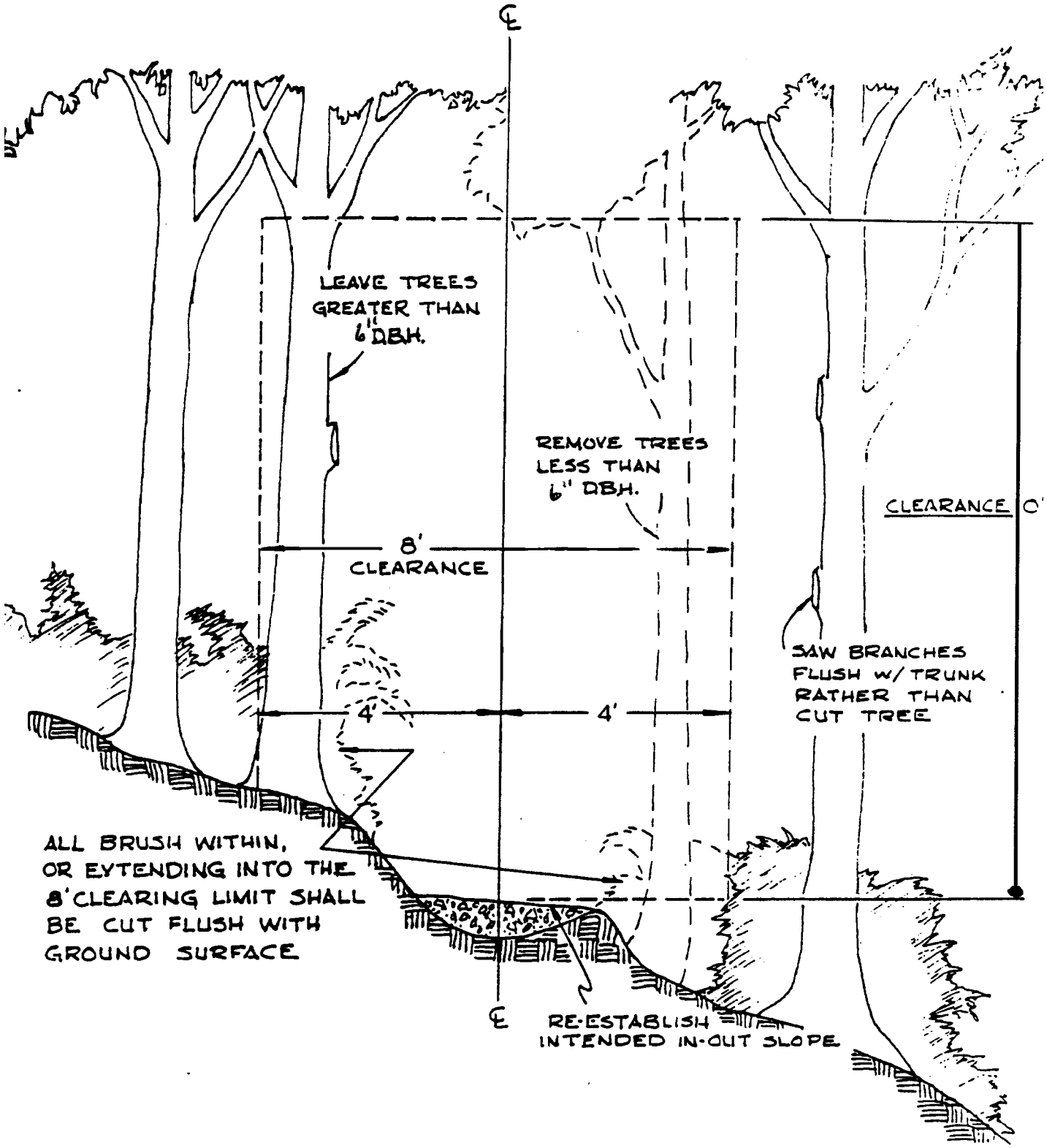
Source: *Trails Handbook*, California Department of Parks and Recreation

Figure 2

TRAVELWAY CLEARING

North Fork American River Trail

Placer County, California



north fork associates

Source: *Trails Handbook*, California Department of Parks and Recreation

Figure 3

TRAILWAY CLEARING LIMITS

North Fork American River Trail

Placer County, California

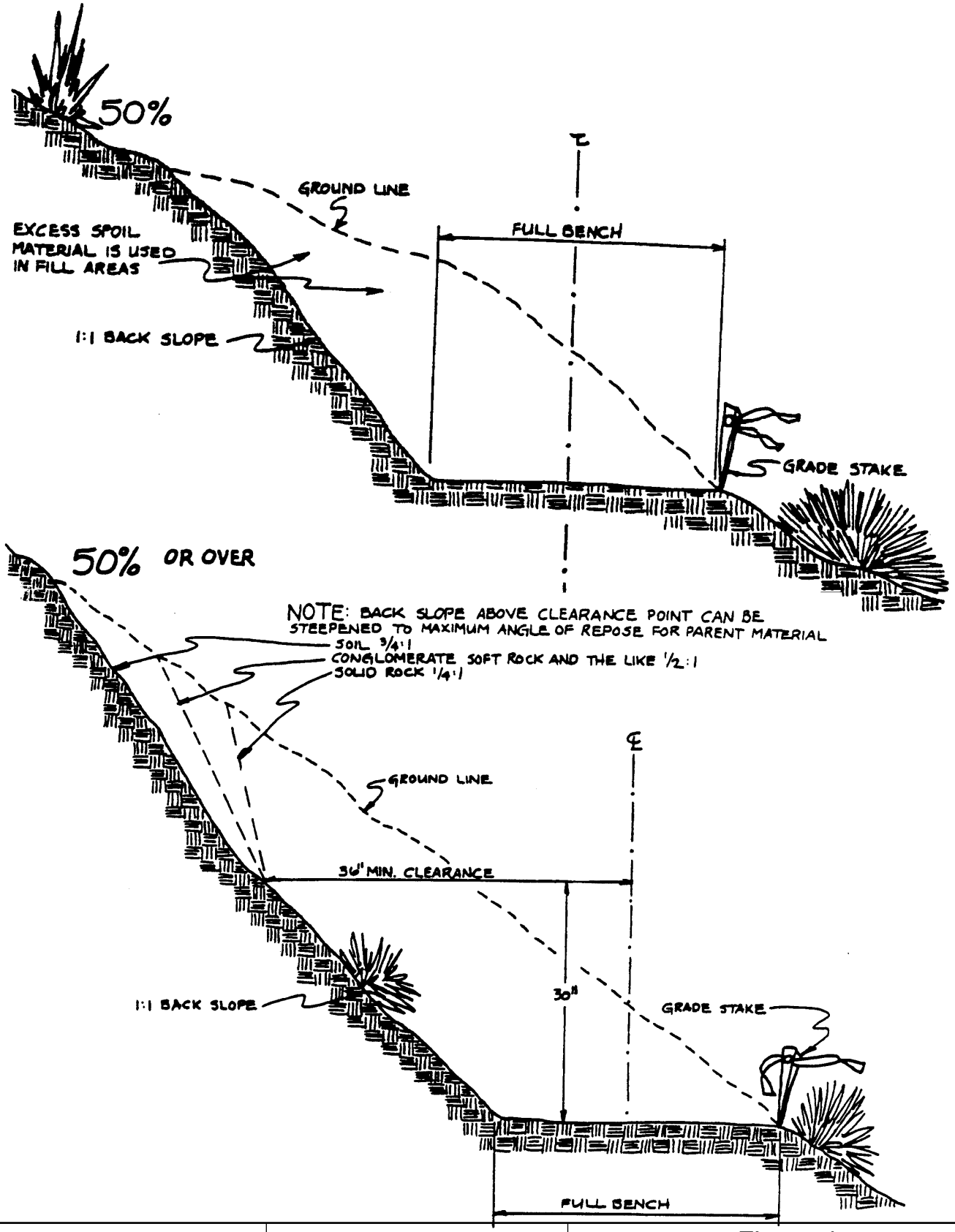


Figure 4

TRAILWAY EXCAVATIONS

North Fork American River Trail

Placer County, California

north fork associates

Source: *Trails Handbook*, California Department of Parks and Recreation

are required, they will be 32 inches to the top of the rail as measured from the top of the bridge decking. Handrail and post dimensions will be 6 inches by 6 inches rough con heart redwood. No mid-rail diagonal brace will be used. (*See Figure 5*)

Rock-lined stream crossings will be used on the remaining creeks. The trail will drop into the drainage, rocks will be placed in the streambed to provide a somewhat level surface and to armor the stream banks, and the trail will ascend from the streambed. At the creek fords, the approaching trail grade must be higher than the stream grade to prevent water from escaping the streambed and running down the trail. All rocks needed for the stream crossings will be gathered on-site. (*See Figures 6, 7, and 8*)

In a situation where the volume of surface water runoff exceeds that which a normal outslope design can accommodate, a drain dip may be required. Drain dips are exaggerated outslopes that terminate in a shallow trough and should be located where they will be most effective. Features such as natural contours, side slope, and trail grade must be studied closely to determine where the largest volume of water can be intercepted and diverted from the trail. Soil readability, vegetative cover, and downstream steepness must be considered when selecting the drain point or trough outflow location. Ideally, drain dips should be located where natural swales or drainages bisect the trail. To function properly, drain dips must be maintained. Sediment and debris that build up in the trough must be removed and the trail surfaces re-worked to restore their shape and outslope. (*See Figure 9*)

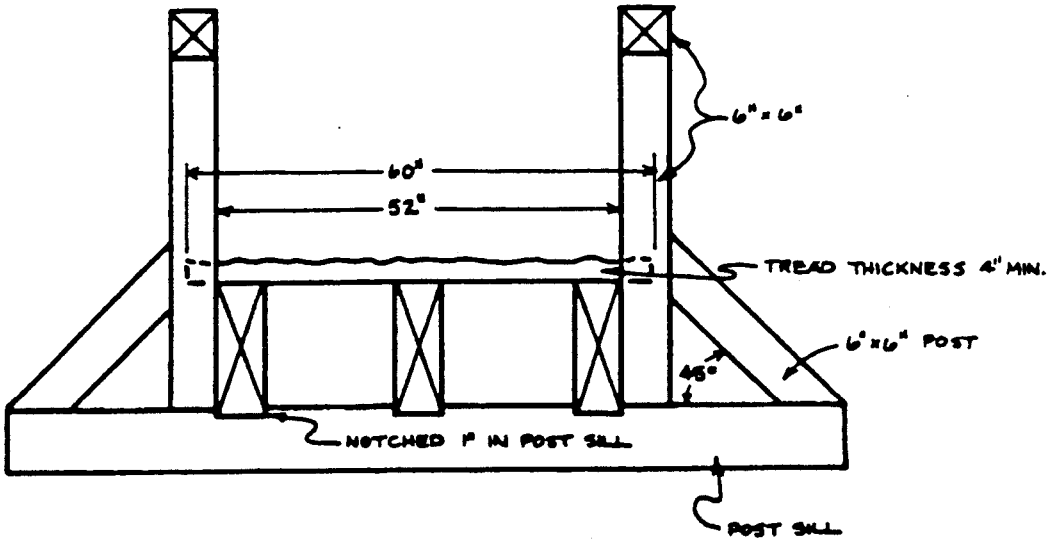
6. Rock Retaining Walls

More than 35 rock retaining walls need to be constructed along the trail route. Retaining walls constructed of rock provide an aesthetically pleasing, very durable solution that will withstand extreme weather conditions and trail use. However, dry rock walls (rock laid without mortar) take time, experience, and are very labor intensive. Planning rock wall construction must consider the natural features of the work site. Existing rocks and bedrock can be used as anchors and keystones. As much as possible, all materials will be gathered on-site.

Selected rock and stones will be sound, durable, and have at least one or more good uniform surface. The rock shape should allow the rock to be laid with the majority of the rock's weight set back into the wall. Fifty percent of the stones in the wall should be greater than one cubic foot. Look for rocks that are reasonable in size. It's not worth the time or energy to move huge rocks. The same result can be achieved with two or more carefully selected and placed smaller rocks.

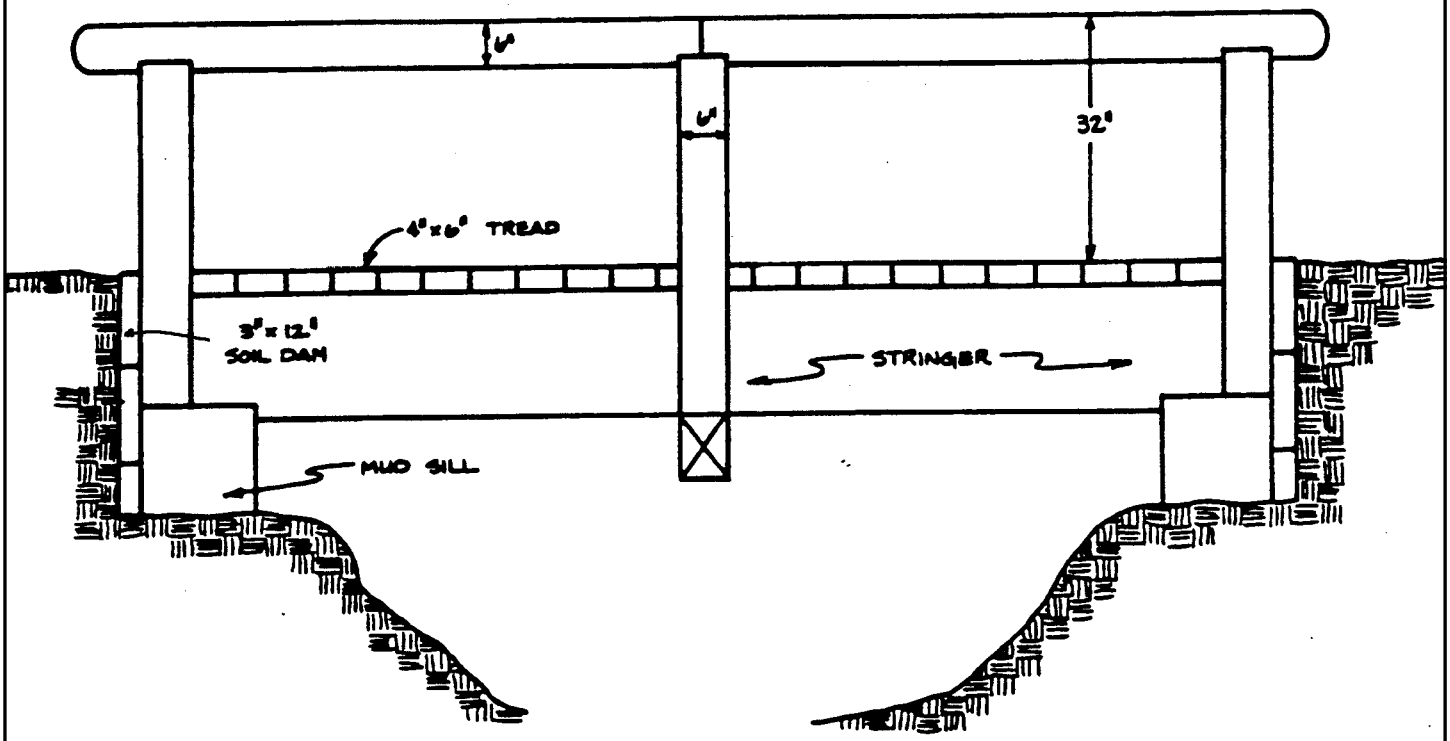
Excavation of an adequate sized footing is the key to a long lasting stable wall. The excavation for the foundation width should be 1-1/2 times he wall height. The entire footing should be in undisturbed native soil. At least one third of the wall height should be below the ground line. Foundation rocks will be laid with no overhang protruding beyond the footing. Each foundation rock will be firmly set with a 3% batter (angle) into the wall.

Rock should be laid at the lowest point of the wall. The rocks should be laid in tiers of roughly equal height. At least one quarter of the outer facing rocks should be header



END VIEW

SIDE VIEW



north fork associates

Scale 1 inch =2 feet

Source: *Trails Handbook*, California Department of Parks and Recreation

Figure 5

HORSE BRIDGE

North Fork American River Trail

Placer County, California

north fork associates

Figure 6

STREAM CROSSING

North Fork American River Trail

Placer County, California

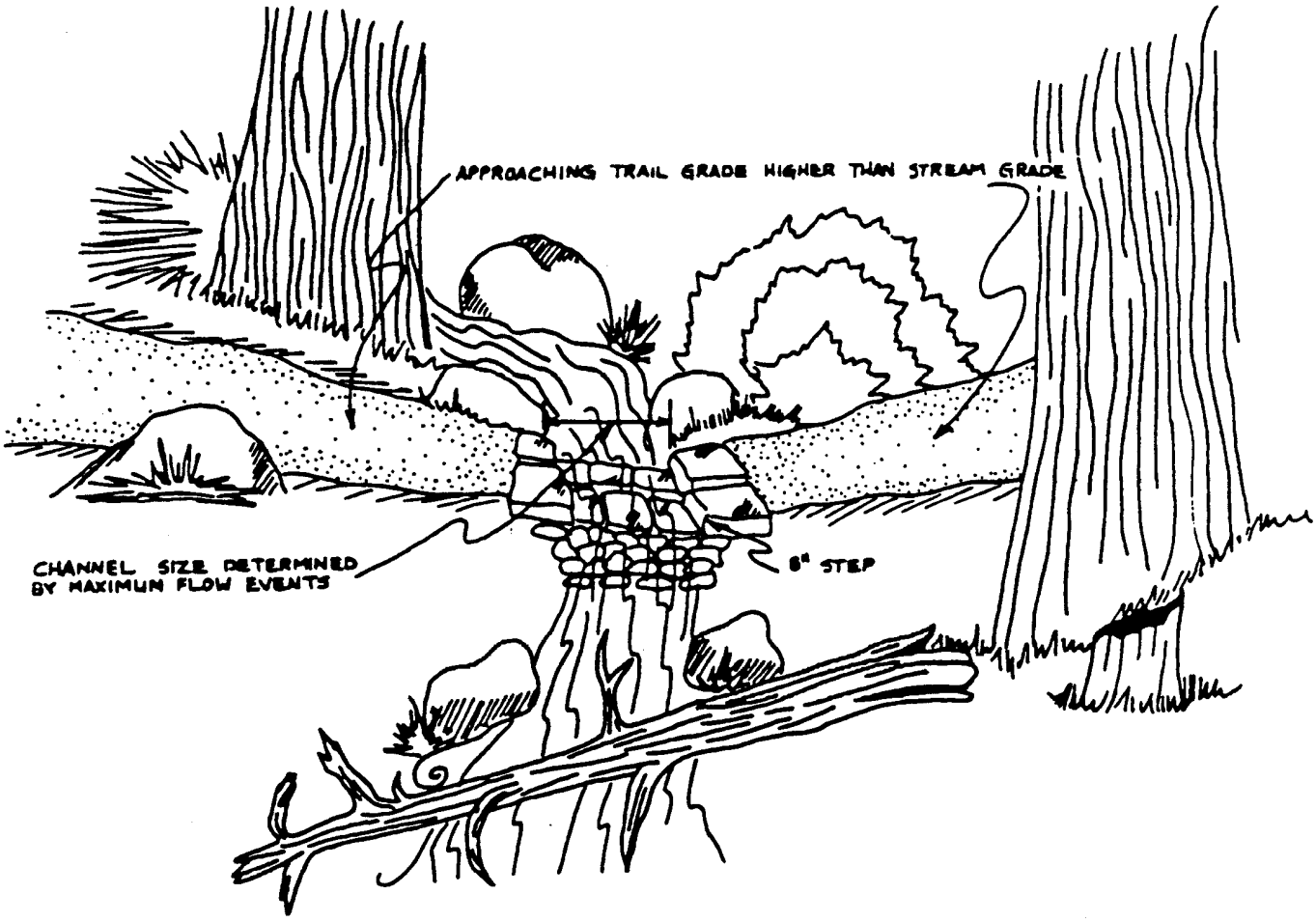
north fork associates

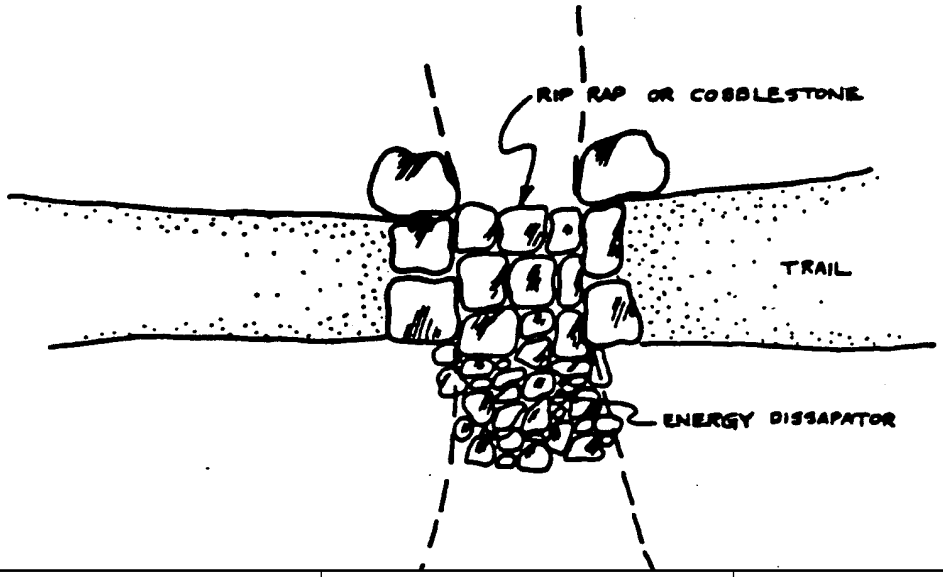
Figure 7

ROCK LINED STREAM BED

North Fork American River Trail

Placer County, California





north fork associates

Source: *Trails Handbook*, California Department of Parks and Recreation

Figure 8

CREEK FORD

North Fork American River Trail

Placer County, California

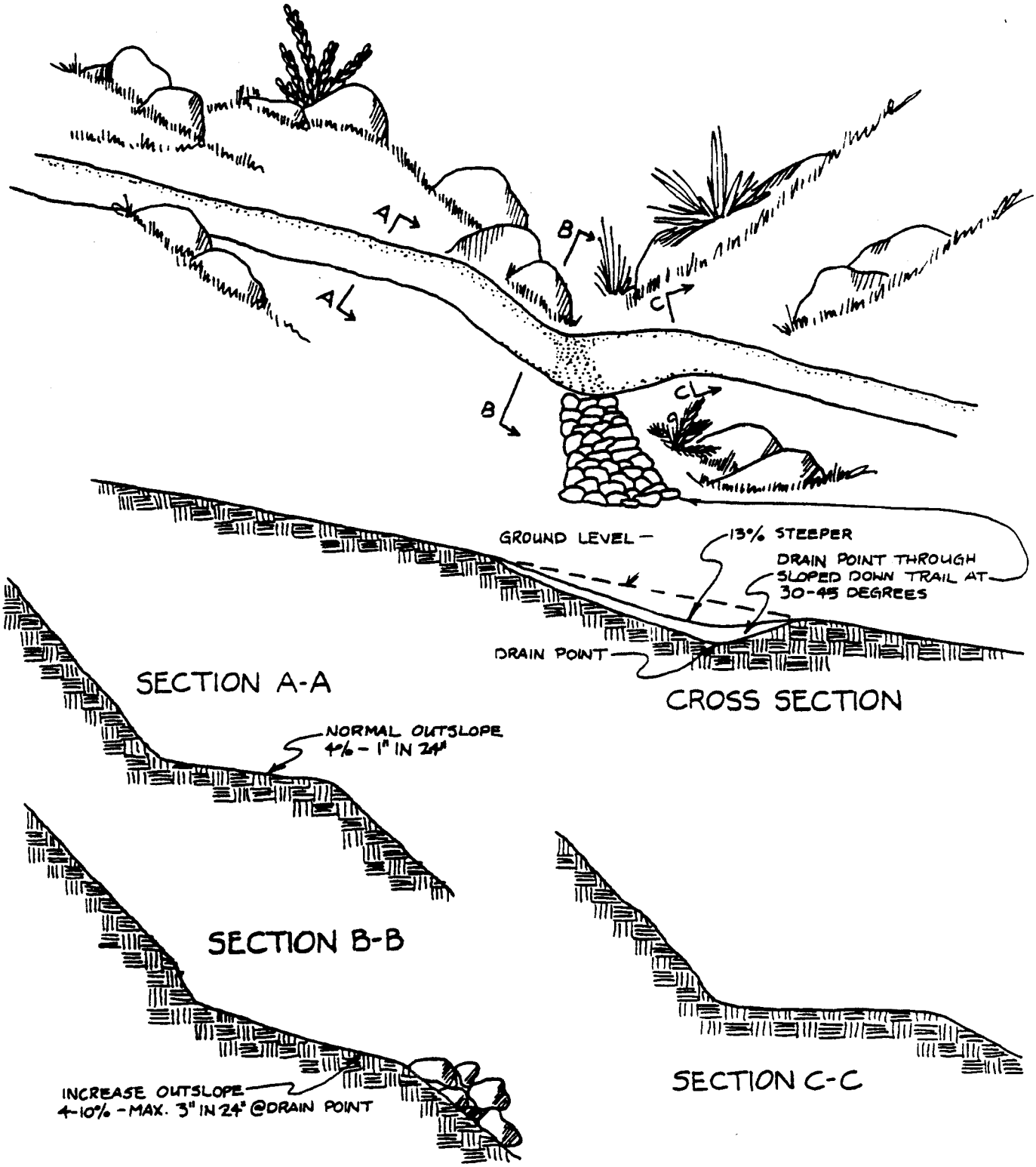


Figure 9

DRAIN DIP

North Fork American River Trail

Placer County, California

Source: *Trails Handbook*, California Department of Parks and Recreation

rocks, which span the entire thickness of the wall. Make face-to-face contact on all rock-to-rock placements. Trim the rock, if practical, to achieve adequate contact. Break the joints of the rocks on succeeding tiers similar to bricklaying. The wall face should batter 3% back into the slope. Once the rocks are in position, stuff small rocks in the gaps to strengthen its placement and secure it in position. The top of the wall should reflect the trail bed drainage design and have a minimum of 4 inches of aggregate or soil for the trail tread. (*See Figures 10, 11, and 12*)

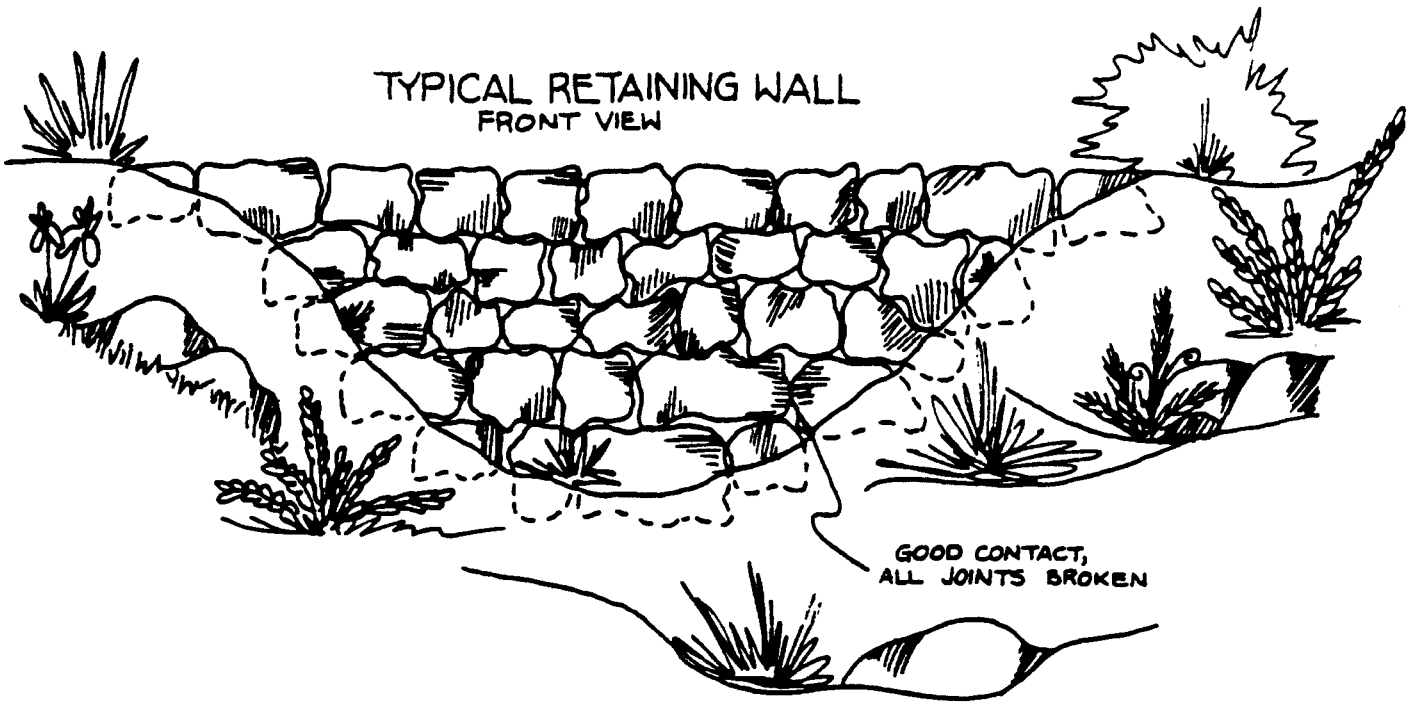
7. Best Management Practices for Erosion and Siltation Prevention

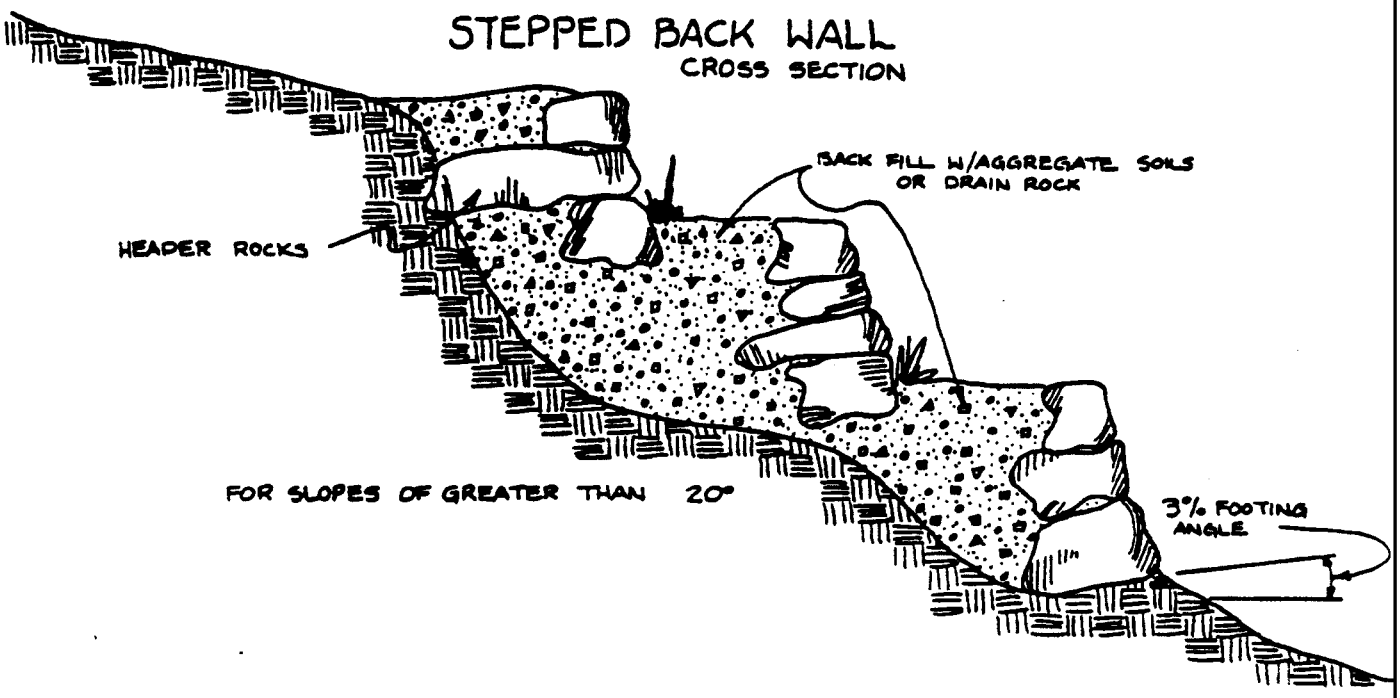
The mission of the California Department of Parks and Recreation (DPR) is to "preserve the State's extraordinary biological diversity, protecting the most valued natural and cultural resources." In keeping with that mission, trail construction Best Management Practices (BMPs) have been suggested for trail projects within the Auburn SRA. To minimize the effects of trail construction, as it relates to soil transportation and erosion, several techniques have been identified as necessary during the construction phase:

- Rake and store all vegetation and duff from trail route prior to excavation. These materials will be scattered on the exposed soil after trail construction to reduce erosion and assist in native plant propagation.
- Place stored duff and plant material on exposed soil as sections of the trail are completed. Do not wait until all trail construction is completed to begin this process.
- Adhere strictly to the design criteria of the Trail Plan—particularly the requirements for outslope and drain dips.
- Install silt fences on approaches to and from stream crossings. The silt fence will intercept soil and rocks that may fall into the drainage from construction activity. Side cast of excavated soil along the rest of the trail route should disperse naturally and revegetate. Use care when removing silt fences to prevent captured material from rolling into the drainage
- Properly place rocks in stream fords to act as dissipaters and trap sediments from migrating downstream.
- Restrict construction during extreme weather conditions. Do not move soil in the summer due to low soil moisture, and avoid periods of heavy rain in the winter.

8. Supervision/Quality Control

It is highly recommended that a trail coordinator/technical supervisor be hired by the County to oversee this trail project. The first task for the trail coordinator will be to tight flag the final trail route after the trail corridor has been brushed. A representative of DPR will approve the final trail alignment. After that task, there will be a period of orientation/training so the hand crew will be able to safely construct the trail using DPR Trail Standards. Having the coordinator on site during the construction phase will ensure that these standards are followed and provide a source for technical advice on construction of rock walls, stream fords, and bridges. This position is accounted for in the project cost estimate.





north fork associates

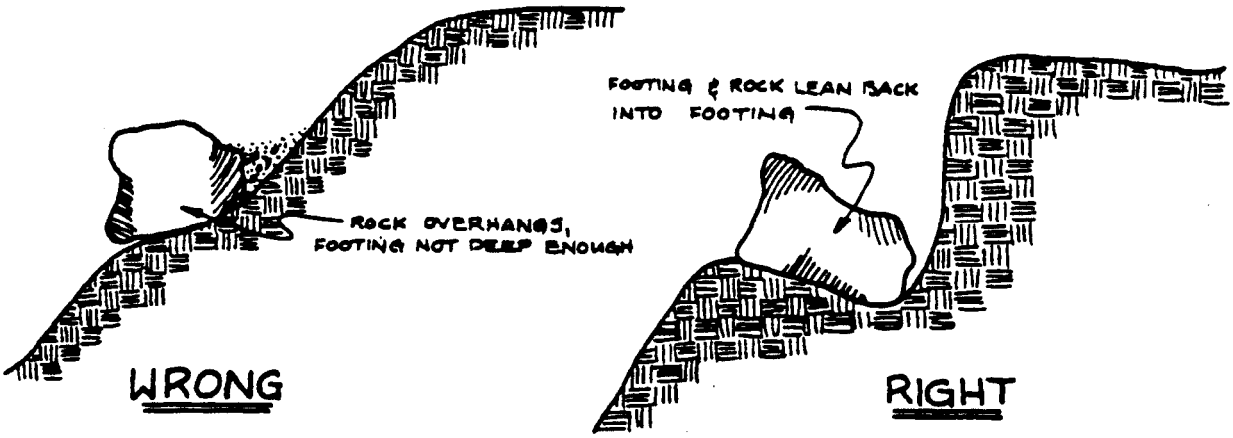
Source: *Trails Handbook*, California Department of Parks and Recreation

Figure 10

MULTI-TIER ROCK WALL

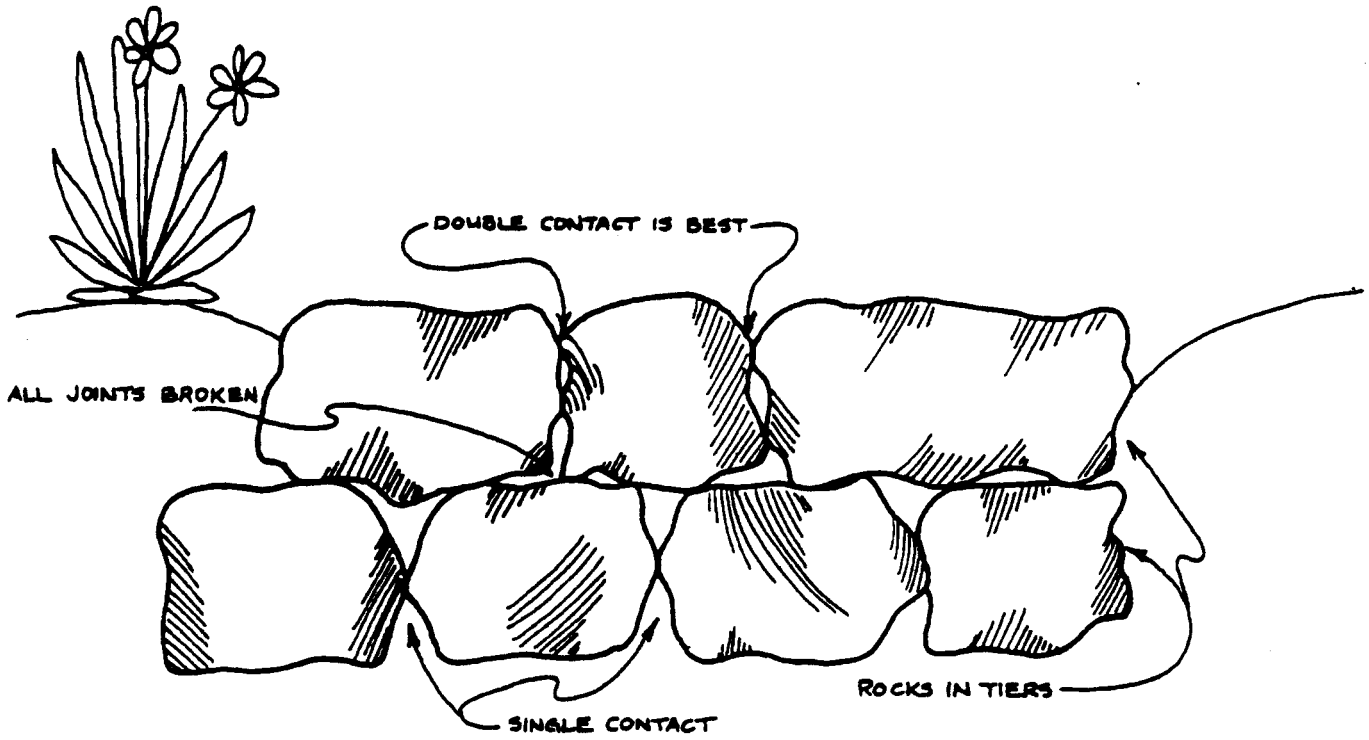
North Fork American River Trail

Placer County, California



DIG A GOOD, SOLID FOOTING, & LEAN ROCK BACK, INTO THE FOOTING

CROSS SECTION



MAKE GOOD CONTACT & BREAK ALL JOINTS

FRONT VIEW

north fork associates

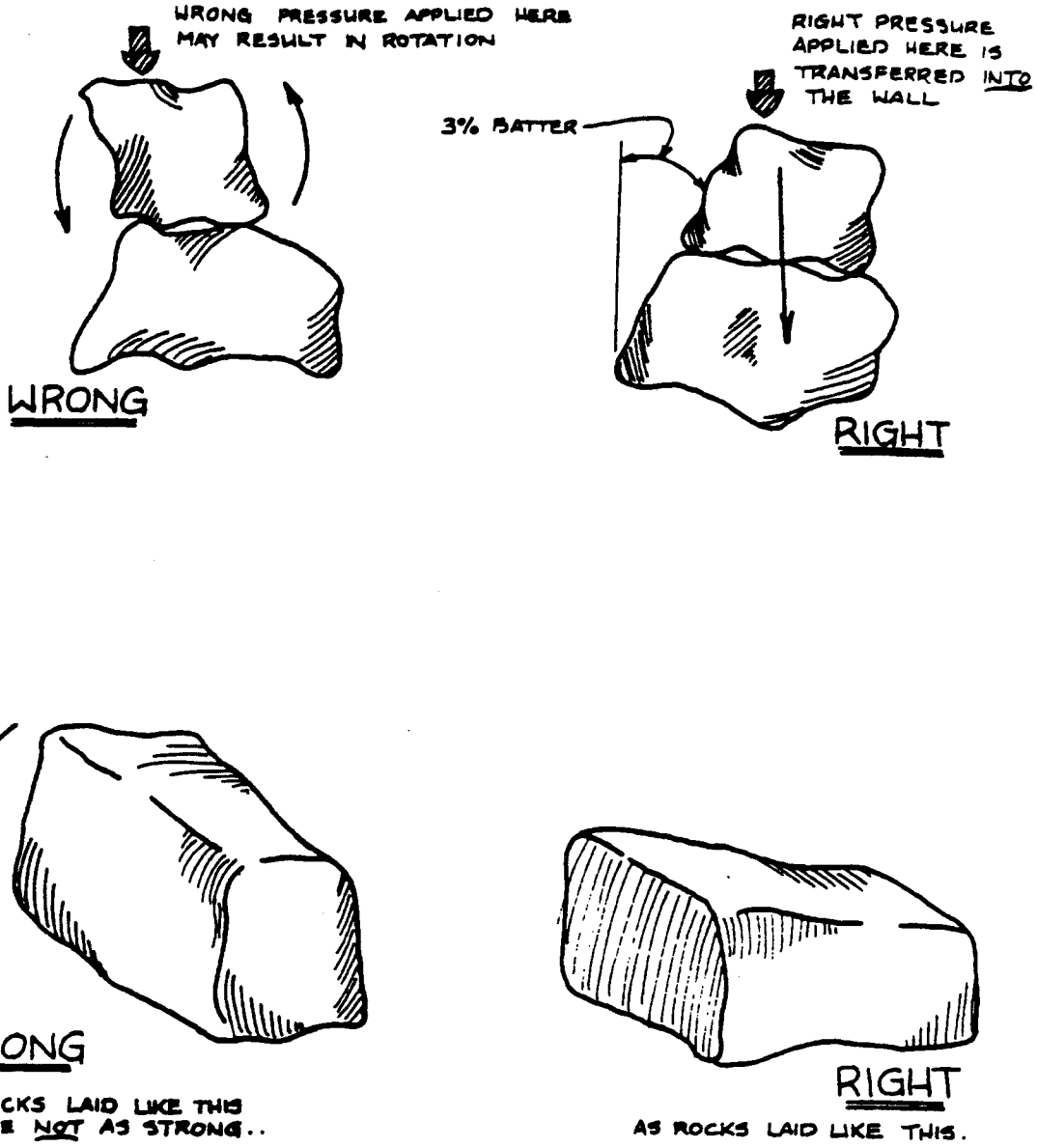
Source: *Trails Handbook*, California Department of Parks and Recreation

Figure 11

DRY WALL FUNDAMENTALS

North Fork American River Trail

Placer County, California



north fork associates

Source: *Trails Handbook*, California Department of Parks and Recreation

Figure 12

LAYING ROCK

North Fork American River Trail

Placer County, California

9. Interpretive Program

A key component of this trail project is the interpretive program. Self-guided informational signage will be provided to inform park visitors of natural, cultural, and physical features encountered along the trail route. Although trail use alone lends itself to an active recreation experience, this can be enhanced with the education of trail users on the more subtle features of the canyon environment. The following 5 pages provide examples of interpretive opportunities that could be made available along the trail route.

10. Signs, Fences, and Gates

Although the trail experience would be enhanced without an overabundance of informational signs, there is a definite need for basic signage. *Figure 13* provides some examples of trail signs that could be used on the North Fork Trail.

While the trail has been designed to be barrier free, some deterrent to prohibit motorized use on the trail is required. Commonly this issue is addressed by the installation of walk-throughs or stiles at the trail entrance, or intersections with roads. As there is no existing fencing in the project areas, large rocks can be placed adjacent to the walk-throughs to discourage use by motor vehicles. (*See Figure 14*)

The only fencing planned on the North Fork Trail Project is the installation of a 6-foot cyclone fence around the perimeter of the Foresthill Bridge Staging Area. This fence was suggested by the equestrian representatives on the Trail Advisory Group to assist in corralling runaway horses and preventing the animals from running into traffic.

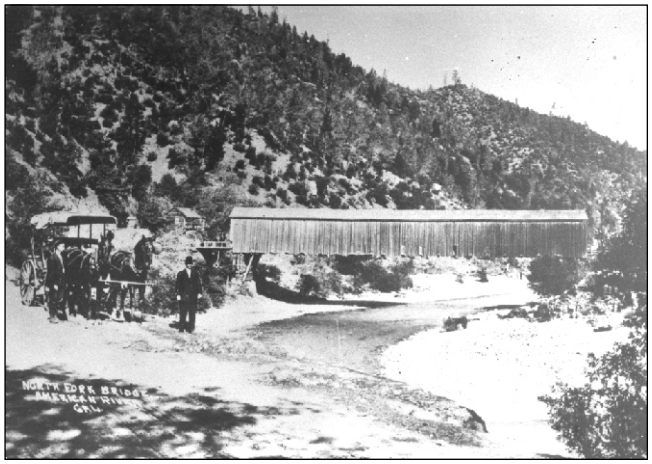
11. *Staging Areas*

An equestrian staging area will be constructed at each end of the trail. Hiker and mountain bikes will use existing parking at the Confluence and at Ponderosa Bridge. On the Confluence end of the trail east of the Foresthill Bridge, the currently abandoned parking lot—approximately 300 feet long by 140 feet wide—will be transformed into an equestrian staging area. The existing gate will be relocated approximately 80 feet to the east to facilitate ingress to the parking lot. The entire area will be enclosed by 6-foot cyclone fence with either black or green vinyl coating. A new gate will be installed at the staging area. The current chip seal surface is in a state of disrepair and is dissolving. DPR Trail Standards require either a gravel or dirt surface for equestrian facilities so, as the surface continues to deteriorate, it will eventually conform to those standards.

Hitching posts, an accessible portable restroom (there is no source of water at this location), and an informational kiosk will be installed to provide information on the trail, a trail map, emergency phone numbers, and phone numbers to report incidents of trail conflicts and hazards. An old construction road will be rehabilitated to provide access to Segment 5 of the North Fork Trail. *Approximate cost of improvements: $20,000.*

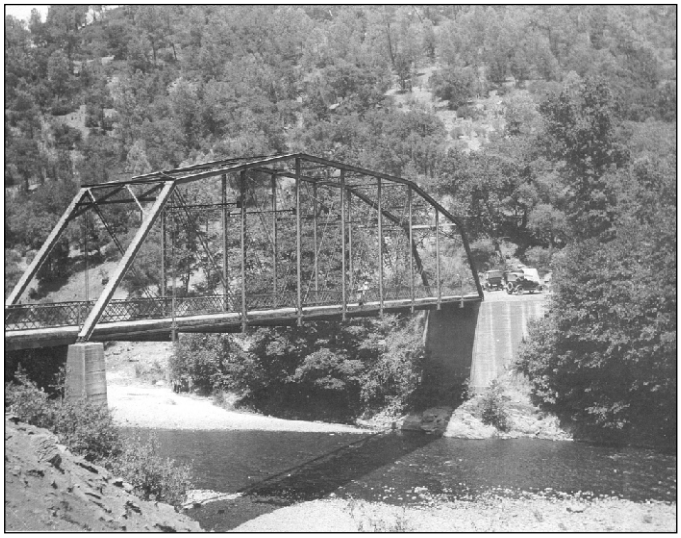
(Refer to Figure 15 for map of trail segments)

An additional staging area will be constructed on Ponderosa Way, approximately 400 yards east of the bridge on the south side of the canyon. The area will be constructed by cut and fill of a road bank and a ledge below the roadway. Some trees and vegetation will be removed prior to grading. After final grading the staging area will be approximately 150



The old wooden covered toll bridge was built in 1875 and used until 1911. In the 1870's, tolls ranged from 6¢ for a cow to 50¢ for a horseman and $1 for a wagon with two horses. Some of the rock abutments from this bridge remain about ½ mile upstream.

The "Steel" bridge carried wagon & vehicle traffic from 1911 to 1955. The concrete abutments of this bridge are still visible just upstream from the current Old Foresthill Road Bridge.



The New Foresthill bridge was completed in 1973. In this April 1972 photo, a crane is setting on one of the middle sections of the bridge. The "Curved" Old Foresthill Road Bridge (in the foreground) was built in 1955 to replace the "Steel" Bridge which was no longer safe for larger vehicles.

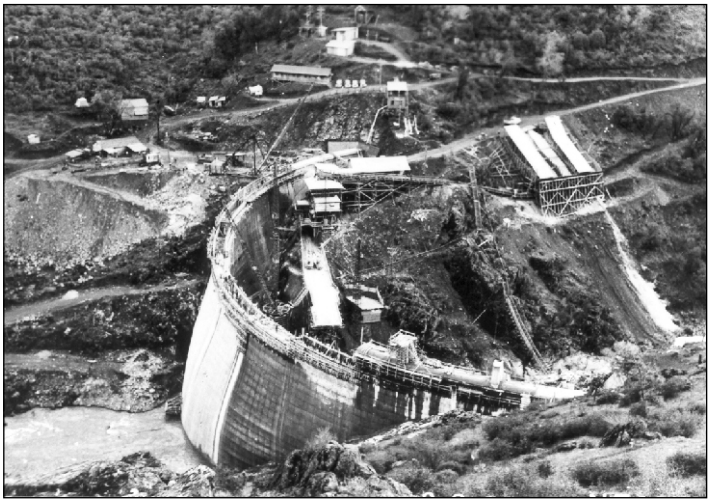
north fork associates

Photos courtesy of California State Parks, Ranger M. G. Lynch

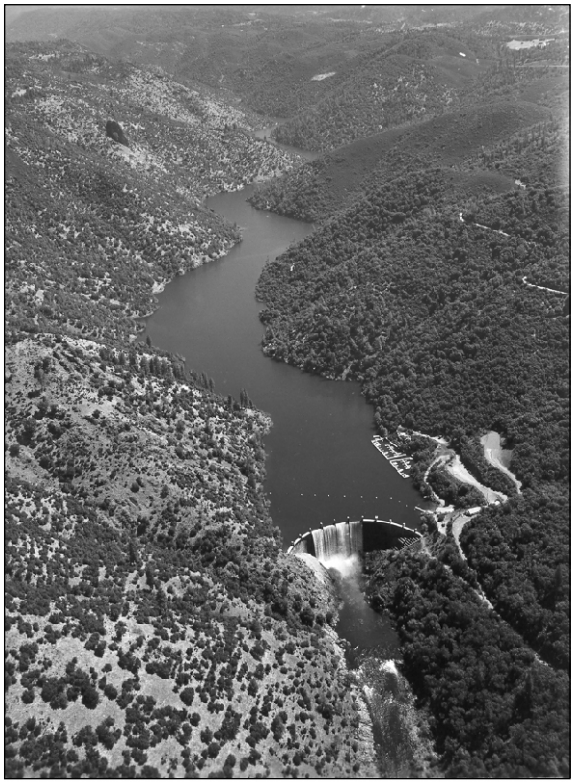
INTERPRETIVE PANEL 1

North Fork American River Trail

Placer County, California



The Northfork Dam was constructed in 1938 to reduce the flow of debris from hydraulic mining operations upstream.



Lake Clementine is nearly 3 miles long and holds 14,600 acre feet of water.

Water skiing and fishing are the primary visitor activities at Lake Clementine.

north fork associates

Photos courtesy of California State Parks, Ranger M. G. Lynch

INTERPRETIVE PANEL 2

North Fork American River Trail

Placer County, California

Robbers Roost is a prominent landmark overlooking Lake Clementine. The name comes from the gold rush era where lookouts would signal their outlaw cohorts of oncoming stage coaches coming down the Foresthill Turnpike. It is also part of a rich vein of limestone stretching into El Dorado County.

north fork associates

INTERPRETIVE PANEL 3

North Fork American River Trail

Placer County, California

Aerial view from Long Point fuel break of grove of old growth Douglas Fir trees.

Parks and Grounds Supervisor Tim Stofleth standing next to a monster. This tree has a 15 foot circumference, and an estimated age 250-300 years old.

One of several old growth Fir trees near Long Point.

north fork associates

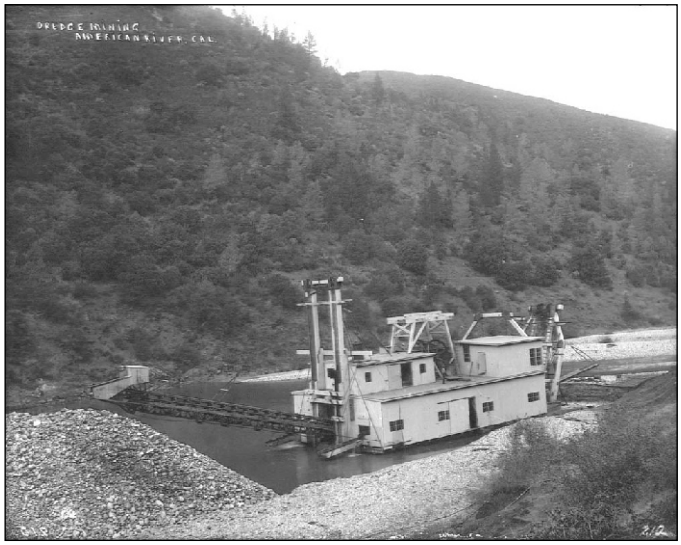
INTERPRETIVE PANEL 4

North Fork American River Trail

Placer County, California

Abandoned ditch used to transport water for placer mining operation. Note vertical tree growing out of ditch. Dash line is centerline of ditch.

Dredger tailings on the banks of the North Fork American.



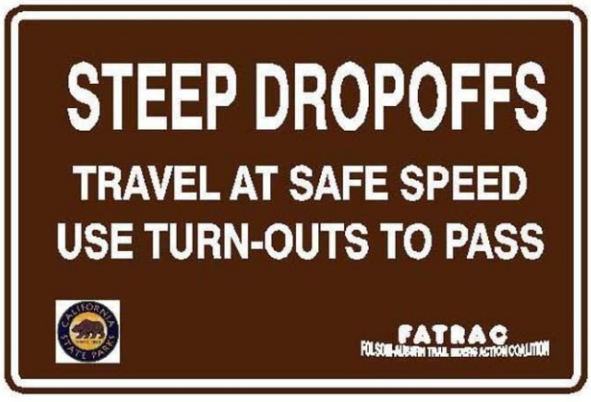
Photograph of a bucket elevator dredge operated by the Pacific Gold Dredging Company. This dredge operated on the North Fork in 1918.

north fork associates

INTERPRETIVE PANEL 5

North Fork American River Trail

Placer County, California



north fork associates

Figure 13

SIGN EXAMPLES

North Fork American River Trail

Placer County, California

north fork associates

Figure 14

PHOTO OF WALK-THROUGH

North Fork American River Trail

Placer County, California

feet long and 100 feet wide. A surface of ¾" road base will be spread on the surface. Hitching posts, an accessible portable restroom, and an informational kiosk will be installed, that will provide information on the trail, a trail map, emergency phone numbers, and phone numbers to report incidents of trail conflicts and hazards. There is no source of water at this location. *Approximate cost of improvements: $12,000.*

In addition to the two (2) formal staging areas, there are additional areas that can provide equestrian access to the North Fork Trail along the Foresthill Road. One alternative access is a parking area on Lake Clementine Road, near the intersection of Foresthill Road—behind a green farm gate is the Lake Access Trail, an abandoned roadway that leads down to Lake Clementine where the proposed North Fork Trail intersects it. A second access is from the paved parking lot at the entrance to Upper Lake Clementine—a dirt road down to Upper Lake Clementine where the North Fork Trail intersects the road (Note: because of high volume vehicle traffic during the summer, this access would be used only between November and May when the road is closed to vehicles). Walk-throughs will be installed where the trail intersects the road to restrict unauthorized access to the trail.

The final alternative staging area is at the Foresthill Divide Loop Trail Trailhead on Foresthill Road, just east of Drivers Flat Road. This abandoned road follows the Long Point fuel break down towards the North Fork American River, where it intersects the proposed North Fork Trail. While there are private property considerations, acquisition of a trail easement may be possible.

12. *Trail Linkage and Emergency Access*

There are three (3) existing multiple use trails within the Auburn State Recreation Area that will link to the proposed North Fork Trail: Clementine Loop Trail, Lake Access Trail, and Long Point Fuel Break Trail. In addition, five (5) existing roads could provide emergency access to the North Fork Trail: Old Foresthill Road at the Confluence, Lake Clementine Road, Lake Access Trail, Upper Lake Clementine Road, and Long Point Fuel Break Road.

TRAIL DESIGN GUIDELINES

The TAG has developed the following guidelines for the proposed trail alignment, design, site preparation and construction. These guidelines may not be appropriate for trails in more remote portions of the North Fork Canyon and were developed specifically for the North Fork Trail—from the Confluence to the Ponderosa Crossing—intended to function as a stand-alone trail.

Trail Alignment

- The trail will as closely as possible follow the contour of the canyon to minimize grades and to protect resources.

- A trail alignment will be selected that minimizes the removal of any native tree greater than 6" diameter at breast height (dbh).
- The alignment will provide a physical separation from the river sufficient to deter trail users from forging user created trails down to the river. Generally the trail will follow an alignment between 800 feet (at the Confluence) and 1200 feet in elevation.

Vegetation Clearance

- The initial clearing for the trail will remove vegetation along the trail alignment corridor from 8 to 15 feet in width and 10 feet in height. The goal will be to remove as little vegetation as possible to construct the trail to the standards indicated below.
- Following trail construction, vegetation clearance will be maintained at 8 feet in width (4 feet on each side of the trail centerline) and 10 feet in height.
- The amount of vegetation to be removed will vary depending on the need to establish clear sight lines.
- All cut vegetation will be chipped and broadcast (where feasible) or hauled out of view of the trail.

Tread Width

- The tread width will be 4 feet wide.
- On steep cross slopes (generally greater than 45 degrees) and/or where required to provide room for trail users to safely pass one another, 5-foot wide turnouts will be provided. Turnouts will be sized to accommodate a horse and allow other trail users to pass. Location and intervals of turnouts will be constructed at the discretion of the trail coordinator.

Construction Methods

- Clearing of vegetation and trail construction will be accomplished by hand crews.

The above guidelines will be used by the involved agencies (Placer County, California State Parks and the Bureau of Reclamation) as the basis for a proposed action to be reviewed and analyzed in accordance with NEPA and CEQA.

PHASING

In order to facilitate phased construction and assist in seeking funding sources, the North Fork Trail has been divided into 5 segments. As shown in *Figure 15*, the trail segments are as follows:

SEGMENT 1 Ponderosa Bridge to Long Point Trail; approximately 16,483 feet
SEGMENT 2 Long Point Trail to Upper Lake Clementine Road; approximately 12,004 feet
SEGMENT 3 Upper Lake Clementine Road to Lake Access Trail; approximately 16,872 feet
SEGMENT 4 Lake Access Trail to Lake Clementine Road; approximately 12,261 feet
SEGMENT 5 Lake Clementine Road to Confluence; approximately 9,277 feet

COST ESTIMATE

Trail construction costs are directly related to the design criteria established by the Trail Advisory Group. The TAG has recommended a four-foot wide trail with pullouts using hand construction. In addition, the meandering style of trail design approved by the TAG is more time consuming to construct and increases the actual length of the trail, therefore driving up the cost.

The total estimated construction cost of the project is **$1,286,550** (see the summary cost estimate that follows *Figure 15*). This estimate does not include any administrative or land acquisition costs. The estimates are based on using California Conservation Corps (CCC) hand crews. Maps of the five (5) individual trail segments, along with detailed cost estimates to construct each segment, are also provided in this section.

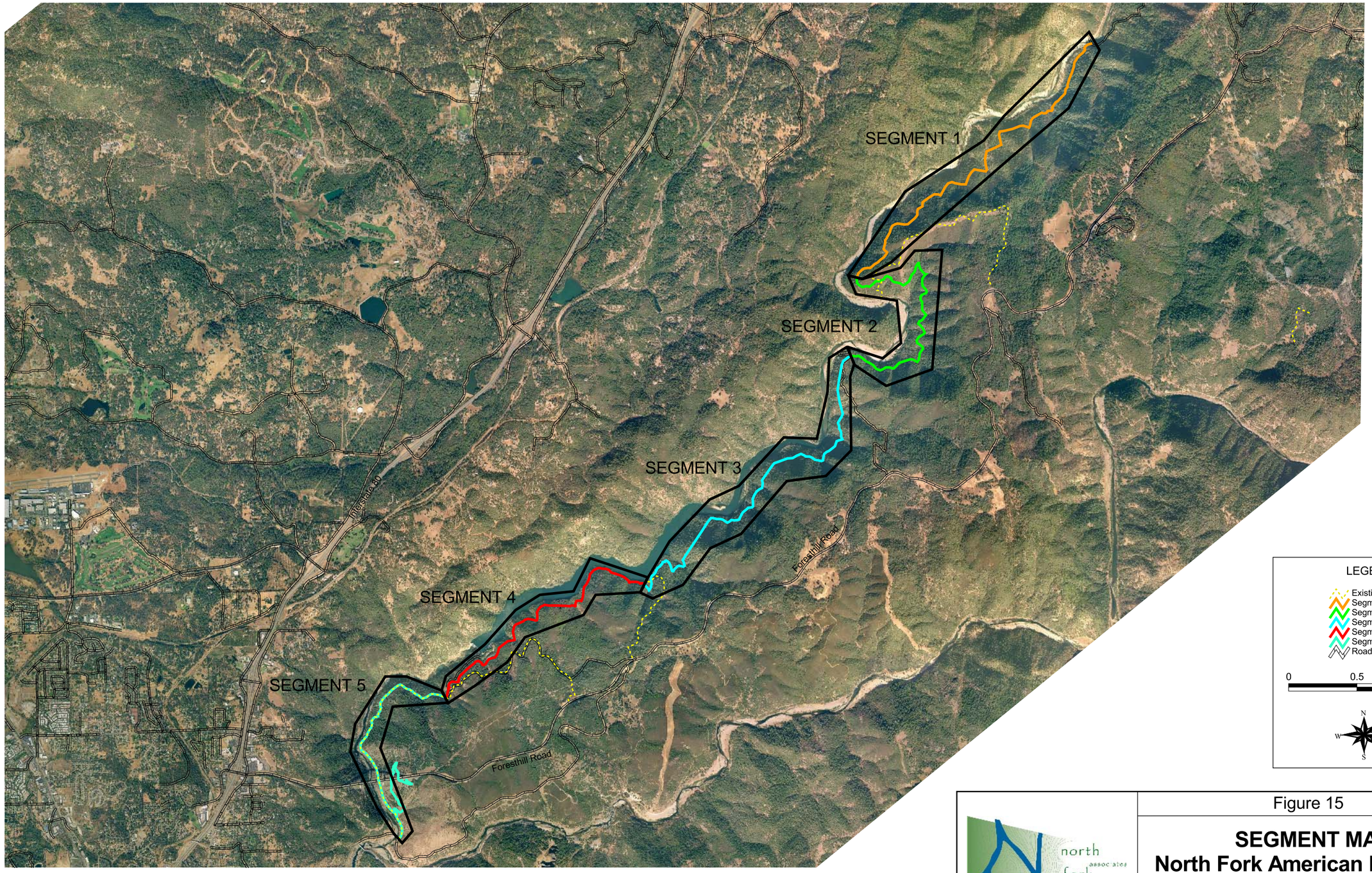


Figure 15

SEGMENT MAP
North Fork American River Trail
Placer County, California

Cost Summary pg 1 9/19/2003

Project Title: North Fork Trail - Hand Construction

Location: Placer County, California

Project Manager: Placer County

Technical Supervisor: Placer County

Proposed Work Force: CCC/Contract

Estimated Project Length: 164

* weeks with 12 person crew, 7 hour work day

Estimated Labor Cost: See Attached Summary Sheet

Estmated Material Cost: See Attached Summary Sheet

Estimated Project Cost: **$1,286,550** **Funding Source:**

Project Need:

Health and Safety: ☐

Resource Protection: ☐

Preservation of Investment: ☐

Visitor Convenience: ☐

Capital Outlay: ☒

Cost Summary pg 1 (2) 9/19/2003

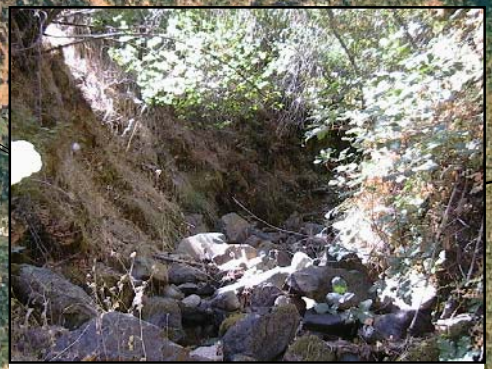
Cost Summary Estimate	UNIT	UNIT COST	ADMINISTRATIVE OVERHEAD PERCENT	TOTAL
Permit Costs:				
Fish and Game	1 ea	$1,500.00		$1,500.00
Cost of Materials:				
Attached Trail Maintenance Cost Sheets	1 ea	$32,277.11		$32,277.11
Attached Material Cost Sheet	0 ea			$0.00
Labor Costs:				
Labor (CCC Costs)	57409 hr	$13.00		$746,313.98
CCC Travel time	8201 hr	$13.00		$106,616.28
Supervision / Coordination:				
Supervison -Technical Supervisor	5920 hr	$27.00		$159,840.00
Equipment Rental Costs:				
Excavator	24 hr	$100.00		$2,400.00
Operator	24 hr	$35.00		$840.00
Pick Up Truck	740 day	Supplied		$0.00
Estimated milage	11100 miles	$0.30		$3,330.00
Staging Area Improvements:				
Forest Hill Bridge	1 ea	$20,000.00		$20,000.00
Ponderosa	1 ea	$12,000.00		$12,000.00
Sign Package	1 ea	$5,000.00		$5,000.00
Interpretive Displays:	1 ea	$18,000.00		$18,000.00
Resource Mitigation Items				
Straw Bales, Sand bags, Silt fencing etc.	1 ea	$10,622.00		$10,622.00
Contingency: 15%	1 ea	$167,810.91		$167,810.91
Total Cost				**$1,286,550**

CONSTRUCTION OR MAINTENANCE ACTIVITY	TOTALS	UNIT		PERSON HOURS OR COST PER UNIT		TOTAL PERSON HOURS	MATERIAL / EQUIPMENT COST
New Trail Clearing	16483	100ft	@	6.00	hr =	988.98	
Trail Reroute & Reconsruction							
Hand Crew Construction/Reconstruction of 48" Tread							
Medium - Soil and Rock Matrix	8242	lin ft	@	0.40	hr =	3296.60	
Heavy - Talus slope/rocky	8242	lin ft	@	0.67	hr =	5494.67	
Retaining Wall Construction							
Rock							
General	1290	cu ft	@	1.50	hr =	1935.00	
Ponderosa Bridge Rock Wall	3000	cu ft	@	1.50	hr =	4500.00	$4,866.67
Riprap	1076	cu ft	@	1.50	hr =	1614.00	
Gathering Time for Rock	2366	cu ft	@	0.25	hr =	591.50	
Mixed by Hand	2.22	cu yd	@	8.00	hr =	17.78	
Form Boards materials	56.00	bd ft	@	1.00	bd ft		$56.00
Cement for Posts	11	sacks	@	$6.00	ea		$66.67
Gravel Sand Cement Mix	2.22	cu yd	@	$35.00	per yd		$77.78
Bridge Construction							
Standard Design	25	lin ft	@	16.00	hr =	400.00	
Bridge #2 Material cost	125	sq ft	Based on $45 sqft Bid From Perma Post				$5,625.00
Silt Fence Installation	300	lin ft	@	0.10	=	30.00	
						Labor Hours	**Materials**
						18868.53	$10,692.11

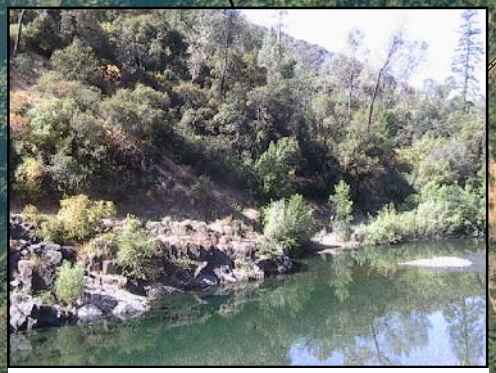
Material Costs Index	Unit Cost	Unit
aggragate	$35.00	yard
Mortar 94lb bag	$5.00	bag
3/8"cable galvanized	$0.90	lin ft
3/8"cable clamps	$0.75	ea
Rebar 5/8"	$0.25	lin ft
Wood Beam Stock	$2.50	bd ft

Prepared by Karl Knapp
Sierra District Maintenance Chief

Staging Areas



Bridge location, 25 foot span



50 foot rock wall will restore historic roadway

north fork associates

LEGEND

- Existing Trails
- Segment 1
- Segment 2
- Roads

0 0.3 0.6 Miles

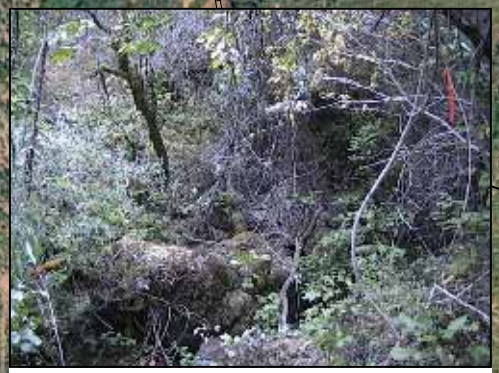
N W E S

SEGMENT 1
North Fork American River Trail
Placer County, California

CONSTRUCTION OR MAINTENANCE ACTIVITY	TOTALS	UNIT		PERSON HOURS OR COST PER UNIT			TOTAL PERSON HOURS	MATERIAL / EQUIPMENT COST
New Trail Clearing	12004	100ft	@	6.00	hr	=	720.24	
Trail Reroute & Reconsruction								
Hand Crew Construction/Reconstruction of 48" Tread								
Light - Primary soil matrix	4004	lin ft	@	0.29	hr	=	1161.16	
Medium - Soil and Rock Matrix	4000	lin ft	@	0.40	hr	=	1600.00	
Heavy - Talus slope/rocky	4000	lin ft	@	0.67	hr	=	2680.00	
Rock Excavation/Removal	1400	cuft	@	1.00			1,400.00	
Retaining Wall Construction								
Rock								
General	1215	cu ft	@	1.50	hr	=	1822.50	
Riprap	1064	cu ft	@	1.50	hr	=	1596.00	
Rock for dry rock structure	84	cu yd	@	$0.00	per yd			$0.00
Gathering Time for Rock	2279	cuft	@	$0.25	hr	=	569.75	
Bridge Abutments-Mortor	180	cuft	@	2.00	hr	=	360.00	
Rock for mortared wall	7	cu yd	@	$0.00	per yd			$0.00
Gathering Time for Rock	180	cuft	@	0.25	hr	=	45.00	
Mortar	140	94 lb bags	@	$5.00	bag			$700.00
Bridge Construction								
Standard Design	24	lin ft	@	16.00	hr	=	384.00	
Bridge #2 Material cost	120	sq ft	Based on $45 sqft Bid From Perma Post					$5,400.00
Silt Fence Installation	100	lin ft	@	0.10	=		10.00	

Labor Hours	**Materials**
12348.65	$6,100.00

Prepared by Karl Knapp
Sierra District Maintenance Chief



Bridge Site, 24 foot span (Creek #12)

DRIVERS FLAT RD

FORESTHILL RD

FORESTHILL RD

DRIVERS FLAT RD

DRIVERS FLAT RD

STHILL RD

LEGEND

Existing Trails
Segment 1
Segment 2
Segment 3
Roads

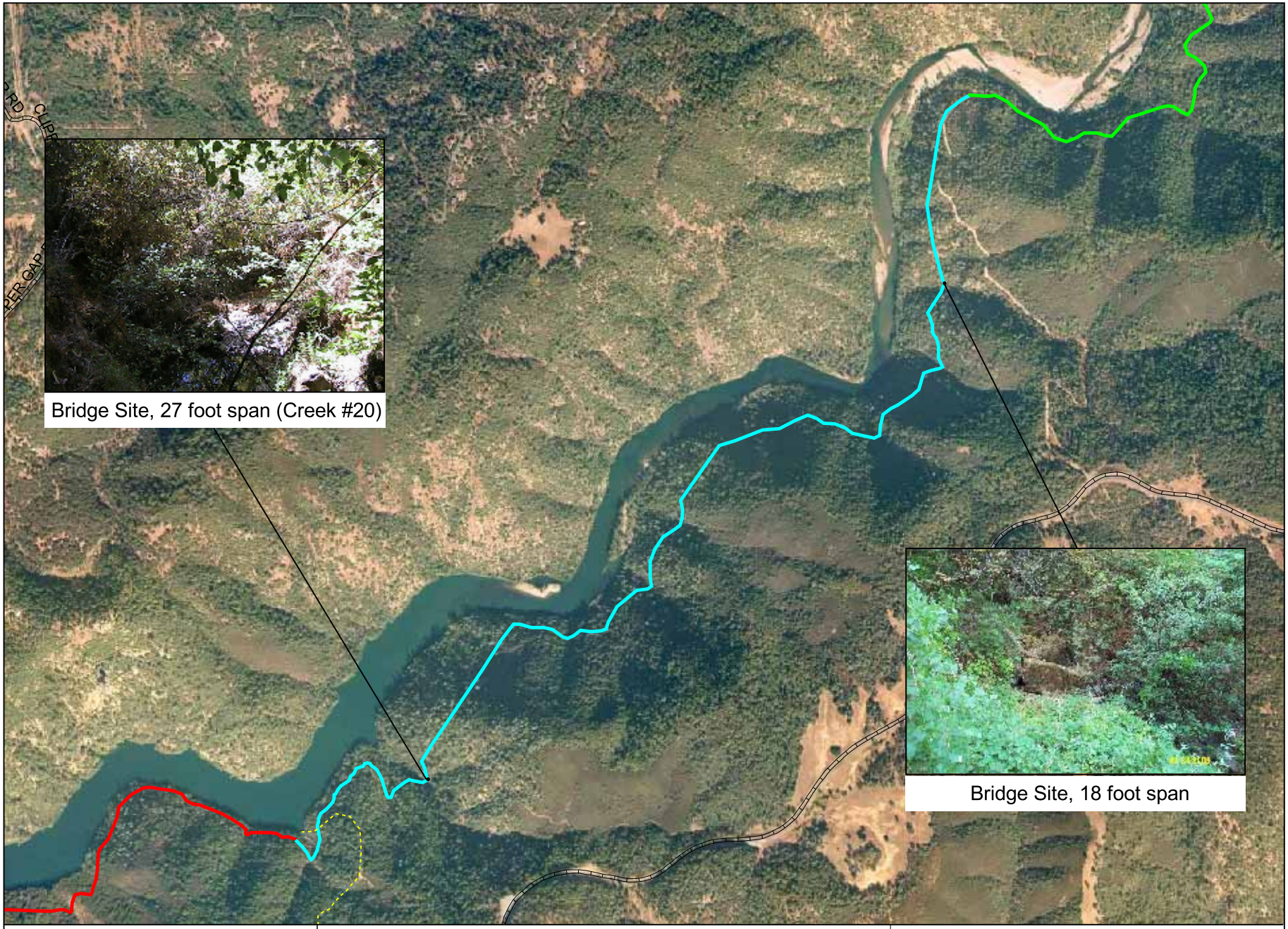
0 0.3 0.6 Miles

N
W E
S

SEGMENT 2
North Fork American River Trail
Placer County, California

CONSTRUCTION OR MAINTENANCE ACTIVITY	TOTALS	UNIT		PERSON HOURS OR COST PER UNIT		TOTAL PERSON HOURS	MATERIAL / EQUIPMENT COST
New Trail Clearing	16872	100ft	@	6.00	hr =	1,012.32	
Trail Reroute & Reconsruction							
Hand Crew Construction/Reconstruction of 48" Tread							
Light - Primary soil matrix	5624	lin ft	@	0.29	hr =	1630.96	
Medium - Soil and Rock Matrix	5624	lin ft	@	0.40	hr =	2249.60	
Heavy - Talus slope/rocky	5624	lin ft	@	0.67	hr =	3768.08	
Rock Excavation/Removal	640	cuft	@	1.00		640.00	
Retaining Wall Construction							
Rock							
General	1890	cu ft	@	1.50	hr =	2835.00	
Riprap	944	cu ft	@	1.50	hr =	1416.00	
Rock for dry rock structure	105	cu yd	@	$0.00	per yd		$0.00
Gathering Time for Rock	2834	cuft	@	$0.25	hr =	708.50	
Mixed by Hand	80.00	cu yd	@	8.00	hr =	640.00	
Form Boards materials	160.00	bd ft	@	1.00	bd ft		$160.00
Cement for Posts	400	sacks	@	$6.00	ea		$2,400.00
Gravel Sand Cement Mix	80.00	cu yd	@	$35.00	per yd		$2,800.00
Bridge Construction							
Standard Design	45	lin ft	@	16.00	hr =	720.00	
Bridge #2 Material cost	225	sq ft	Based on $45 sqft Bid From Perma Post				$10,125.00
Silt Fence Installation	100	lin ft	@	0.10	=	10.00	
						Labor Hours	**Materials**
						15630.46	$15,485.00

Prepared by Karl Knapp
Sierra District Maintenance Chief



LEGEND

- Existing Trails
- Segment 2
- Segment 3
- Segment 4
- Roads

0 0.3 0.6 Miles

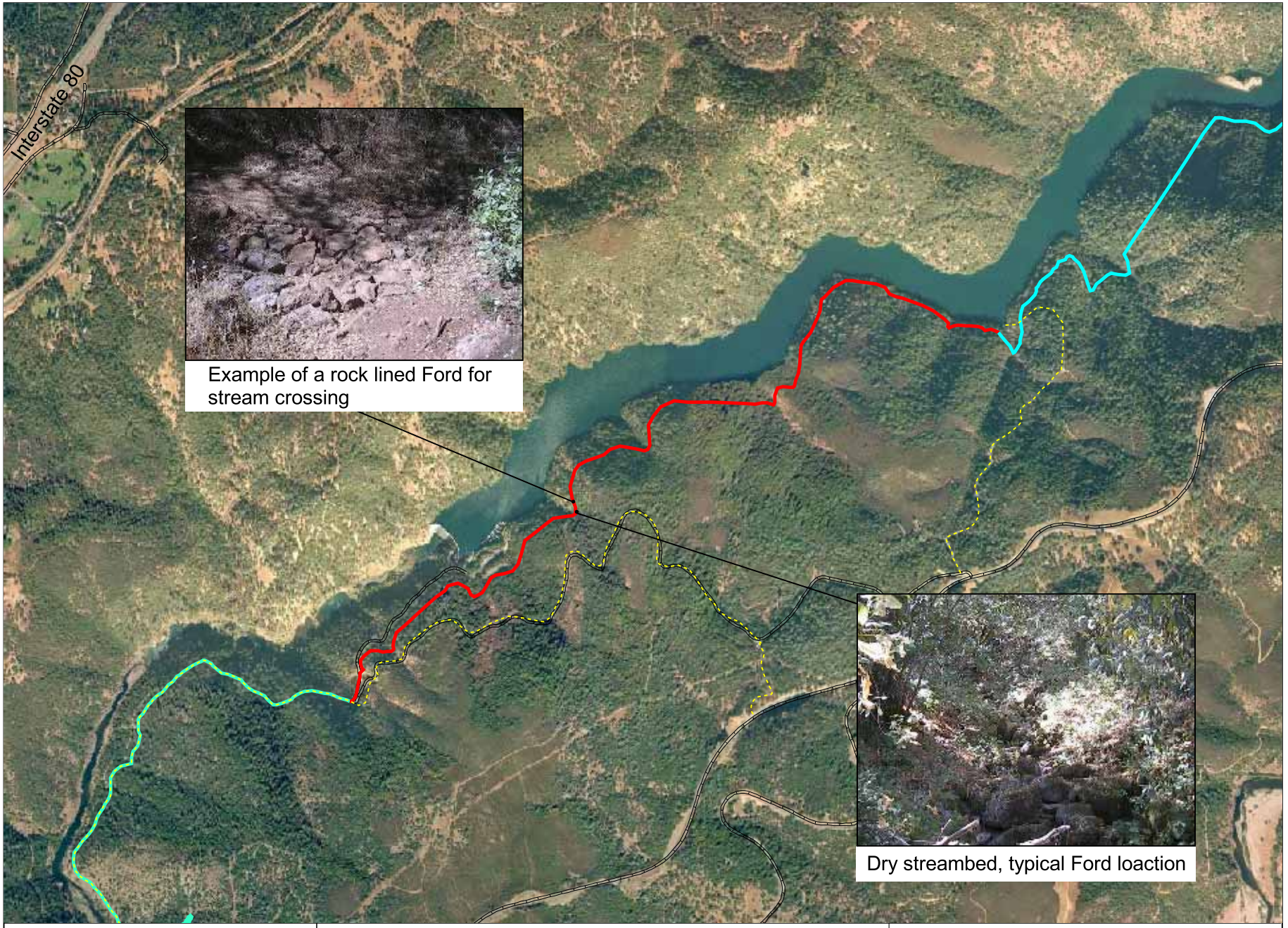
N W E S

SEGMENT 3
North Fork American River Trail
Placer County, California

CONSTRUCTION OR MAINTENANCE ACTIVITY	TOTALS	UNIT		PERSON HOURS OR COST PER UNIT		TOTAL PERSON HOURS	MATERIAL / EQUIPMENT COST
New Trail Clearing	12261	100ft	@	6.00	hr =	735.66	
Trail Reroute & Reconsruction							
Hand Crew Construction/Reconstruction of 48" Tread							
Medium - Soil and Rock Matrix	6131	lin ft	@	0.40	hr =	2452.20	
Heavy - Talus slope/rocky	6131	lin ft	@	0.67	hr =	4107.77	
Rock Excavation/Removal	640	cuft	@	1.00		640.00	
Retaining Wall Construction							
Rock							
General	810	cu ft	@	1.50	hr =	1215.00	
Riprap	576	cu ft	@	1.50	hr =	864.00	
Rock for dry rock structure	51	cu yd	@	$0.00	per yd		$0.00
Gathering Time for Rock	1386	cuft	@	$0.25	hr =	346.50	
Silt Fence Installation	400	lin ft	@	0.10	=	40.00	
						Labor Hours	**Materials**
						10401.13	$0.00

Material Costs Index	Unit Cost	Unit
aggragate	$35.00	yard
Mortar 94lb bag	$5.00	bag
3/8"cable galvanized	$0.90	lin ft
3/8"cable clamps	$0.75	ea
Rebar 5/8"	$0.25	lin ft
Wood Beam Stock	$2.50	bd ft

Prepared by Karl Knapp
Sierra District Maintenance Chief



north fork

LEGEND

- Existing Trails
- Segment 3
- Segment 4
- Segment 5
- Roads

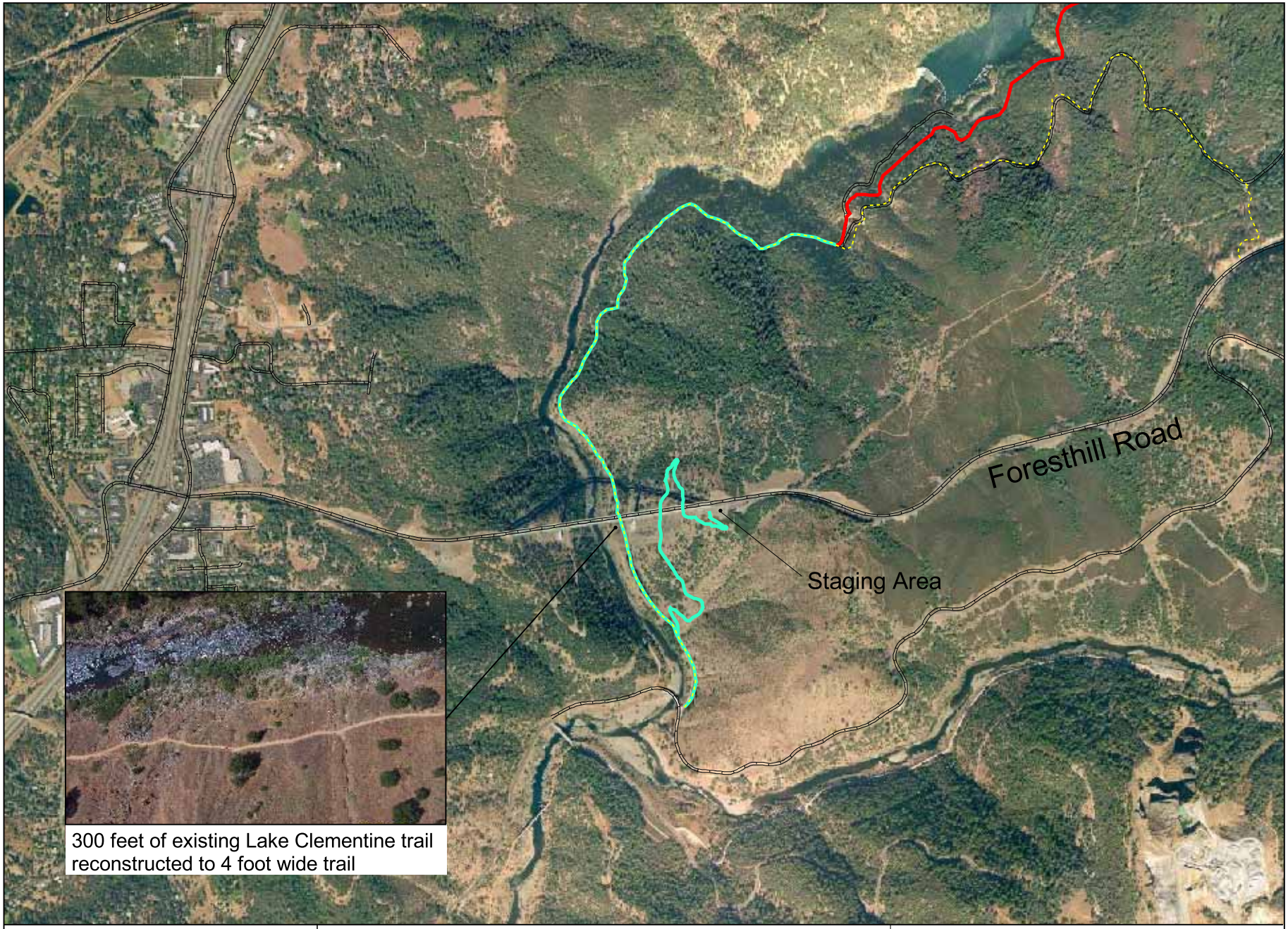
0 0.3 0.6 Miles

N W E S

SEGMENT 4
North Fork American River Trail
Placer County, California

CONSTRUCTION OR MAINTENANCE ACTIVITY	TOTALS	UNIT		PERSON HOURS OR COST PER UNIT		TOTAL PERSON HOURS	MATERIAL / EQUIPMENT COST
Trail Reroute & Reconsruction							
Hand Crew Construction/Reconstruction of 48" Tread							
Medium - Soil and Rock Matrix	400	lin ft	@	0.40 hr	=	160.00	

Labor Hours	Materials
160.00	$0.00



LEGEND

- Existing Trails
- Segment 4
- Segment 5
- Roads

0 0.3 0.6 Miles

N W E S

SEGMENT 5

North Fork American River Trail

Placer County, California

TIMELINE FOR CONSTRUCTION

Using the above cost estimates, we have determined that it would take 164 weeks for a 12-person crew, working 7-hour days, to complete the project. This time frame could be shortened if multiple crews were utilized. Because of climatic issues, several tasks need to be scheduled with weather considerations in mind.

Clearing and Brushing

This task is not affected by the weather, and can be scheduled year round. The only consideration would be during inclement weather on the steep terrain with chainsaws.

Trail Construction

The following conditions are to be considered during trail construction:

- Proper trail construction is dependent on soil moisture. If the soil is too dry, it turns to powder and the cut bank will continually slough off, creating a much wider trail.
- Lack of soil moisture prevents adequate compaction
- Aside from periods of heavy rain, trail construction can be accomplished during the winter months.
- Foot traffic on a freshly cut trail should be avoided during inclement weather.

Stream Crossings (rock armored fords)

Generally, construction on stream crossings should be avoided from November to May, or longer, if water is present in the stream channel. The Streambed Alteration Agreement with California Department of Fish and Game will specify work periods, methods of construction, and erosion control/prevention techniques.

Bridges

The limiting factors for bridge construction is the ability to safely deliver materials to the work site, and the stability of the stream banks or abutment locations. Bridges can be built during the dry periods when trail construction is not practical.

MAINTENANCE BUDGET

Although a properly designed and constructed trail should not require annual maintenance for the first three (3) years, a maintenance schedule and budget should be prepared. After three years, ongoing maintenance can be expected. *Appendix B* includes a schedule (DPR 477) for trail maintenance at a cost of **$8,856** per year starting three (3) years after construction. These cost figures assume the use of CCC crews. These figures

represent trail maintenance only and do not cover the costs of ongoing maintenance at trail facilities such as staging areas or restrooms.

There are several options for funding the trail maintenance budget:

1. Add this budget to the County Park budget and enter into contracts with the CCC.
2. Enter into a Memorandum of Understanding (MOU) with various local trail groups to adopt segments of the trail and handle maintenance responsibilities. *(Groups such as FATRAC, Foresthill Trails Alliance, Meadow Vista Trails Association, or a combination of several may be interested in this option.)*
3. Identify alternative funding sources that can provide ongoing funding source through the Auburn SRA; then this trail can be added to its facility list and funded in the proper manner.

ENVIRONMENTAL REVIEW

It is anticipated that the County will hire a consultant to complete the environmental review under CEQA and NEPA for the North Fork American River Trail. The Trail Plan will serve as a project description for that process. Placer County will be designated as the lead agency for the environmental review under CEQA, while USBR will assume responsibility as lead agency under NEPA. DPR will be designated as a trustee and responsible agency for the CEQA environmental process. DPR and USBR will work closely with the consultant to ensure that all of their concerns are addressed. In addition, DPR maintains the authority to give final approval of the project.

APPENDIX A
TRAIL ADVISORY GROUP

TRAIL ADVISORY GROUP

Name	Activity	Affiliation
John Krogsrud	Runner, Canyon Scramble	Sierra Club
Janet Peterson	Equestrian	Meadow Vista Trails Association
Sherri Osborn	Runner, Hiker	Foresthill Trails Alliance
Tom McMahan	Hiker	Sierra Club
Jim Ferris	Hiker	PARC, Canyon Keepers
Joe Larkin	Equestrian, Runner	Western States Trail Foundation
Bill Wauters	Hiker, River User	PARC, Sierra Club
Russ Stein	Mountain Biker	FATRAC
Eric Peach	Hiker, River User	PARC, Sierra Club
Terry Davis	Hiker, River User	Sierra Club, PARC
Jill Dampier		California State Parks
Jim Micheaels		California State Parks

SCHEDULE FOR MAINTENANCE ☑ **OR HOUSEKEEPING** ☐

NAME OF FACILITY North Fork | FEET 66897 | MI 12.7 | WIDTH 4 | FACILITY NO. 0

JOB DESCRIPTION	DAILY TO ANNUAL CYCLE	PERSON HOURS DAILY TO ANNUAL	YEARLY TOTAL PH	YEARLY TOTAL MAT'L	2 TO 5 YEAR CYCLE 2 YR	3 YR	4 YR	5 YR	NEXT 3 F.Y. SCHEDULED			TOTAL PH	TOTAL MAT'L	PERSONAL SERVICES Class	PERSON HOURS
Safety Inspection	66897	Feet Divided By 2 mile per Hour Hiking time or 10560 feet	6.33											PMS	6.33
Yearly Brushing	66897 3	Feet Divided by 500 feet per person hour year cycle between brushing	44.60	Contract $557.48		CCC		Contract	$12.50	per hour					
Slough and Berm Maintenance	66897 3	Feet Divided by 75 feet per person hour year cycle	297.32	Contract $3,716.50		CCC		Contract	$12.50	per hour					
Down Tree Removal	3 1 3 3	Number of Down Trees from trail log divided by trail Age Trail Age Yearly Average of Down Trees times average of 1 hour per tree	3.00	Contract $37.50		CCC		Contract	$12.50	per hour					
Miscelleanous Logging Out and Brushing Supplies	$332.05	Misc clearing and brushing supplies and equipment. 1 brush blade per mile plus saw chain and fuel.		$332.05											
Trail Reroute and Reconstruction	66897 669	1% of trail tread on average feet yearly divided by 7 feet per person hour equals hours annually	95.57	Contract $1,194.59		CCC		Contract	$12.50	per hour					
Turnpike and Causeway Fill Maintenance	0 0 0.00 $35.00	Square feet of turnpike and cause-way to maintain divided by 20 yrs life SqFt per year to maintain divided by 25 sqft of gravel placed per hour cubic yard of gravel at per cubic yard delivered to site	0.00	Contract $0.00 $0.00		CCC		Contract	$12.50	per hour					
Wood Step Maintenance Standard Steps, Cable Steps and Water Bars, Double and Single Interlocking Steps	0 0 0 $1.50 $0.35	From trail log, total number of Wood steps coponents divided by 15 average life span equals steps per year replaced One person hour per step installed 4"x8"x4' treated step at per board foot per foot 5/8" rebar, 6' per step	0.00	Contract $0.00 $0.00		CCC		Contract	$12.50	per hour					
ANNUAL TOTAL MATERIAL COST:				$8,856.52									**TOTAL PERSON HOURS**		**81.43**

EQUIPMENT REQUIRMENTS

TYPE:	WHEN NEEDED	FALL-WTR-SPR-SUM	COST
0		0	$0.00
0		0	$0.00

Two page total $0

SCHEDULE PREPARED BY: 0

DATE: 1/0/1900

DISTRICT ☐ RENTAL ☐

☐ ☐

NAME OF FACILITY North Fork FACILITY NO. 0

JOB DESCRIPTION	PERSON HOURS	DAILY TO ANNUAL	YEARLY TOTAL PH	YEARLY TOTAL MAT'L	2 YR	3 YR	4 YR	5 YR	NEXT 3 F.Y. SCHEDULED			TOTAL PH	TOTAL MAT'L	PERSONAL SERVICES Class	PERSON HOURS
		DAILY TO ANNUAL CYCLE			2 TO 5 YEAR CYCLE										
Wood Retaining Wall Maintenance	0.0	Square Feet of Retaining Wall													
		divided by 20 year life span equals													
	0.0	Square feet of wall replaced yearly													
	0.0	Square feet of wall times 1 person		Contract											
		hour per square foot constructed	0.00	$0.00		CCC		Contract	$12.50	per hour					
	0.0	Square feet at 4 BF needed per sqft													
	$1.75	per board foot material cost		$0.00											
Wood Safety Rail Maintenance	0.0	Lineal feet of hand rails divided by													
		10 year life span equals													
	0.0	Feet replaced per year times		Contract											
		4 person hrs per 10 feet replaced	0	$0.00		CCC		Contract	$12.50	per hour					
		10' of post and 20' of rail per 10'													
		section equals 60 board feet.													
	$1.50	per board foot cost for railings													
	0	board feet equals		$0.00											
Bridge Maintenance	94.0	Lineal feet of bridge divided by													
		25 year life span equals yealy		Contract											
	3.8	feet replaced at 16 hours per foot	60.2	$752.00		CCC		Contract	$12.50	per hour					
	$365.00	per foot material cost replaced		$1,372.40											
Puncheon Maintenance	0.0	Lineal feet of pucheon divided by													
		25 year life span equals yealy		Contract											
	0.0	feet replaced at 1.5 hours per foot	0.0	$0.00		CCC		Contract	$12.50	per hour					
	$50.00	per foot material cost replaced		$0.00											
Other Item Entry Area		$0.00													
		$0.00													
		0													
		0													
Travel Time	500.6	Total work hours on on trail facility		Contract											
	1.0	Average hiking time to work sites	71.5	$894.10		CCC		Contract	$12.50	per hour					
Planning and Supervison	500.6	Work hours times 15% for planning and supervison	75.10											PMW II	75.10
ANNUAL TOTAL MATERIAL COST:			page total	$3,019									**TOTAL PERSON HOURS**		

EQUIPMENT REQUIRMENTS

TYPE:	WHEN NEEDED	FALL-WTR-SPR-SUM	COST
0		0	$0.00
0		0	$0.00

DISTRICT ☐ RENTAL ☐ page tota $0